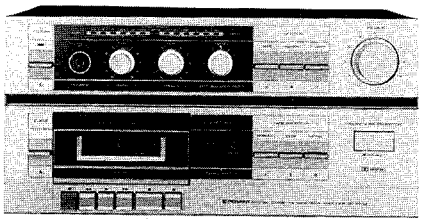
PIONEER®

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP-504-0

STEREO CASSETTE TAPE DECK AMPLIFIER

DC-200Z
DC-201Z

- DC-201Z differs from DC-200Z in style design (color).
- Models DC-200Z and DC-201Z come in versions distinguished as follows:

Type	Applicable model		Power requirement	Destination
	DC-200Z	DC-201Z		
HE	○	–	AC220V (240V)*	European continent
HB	–	○	AC240V (220V)*	United Kingdom
HEZ	–	○	AC220V (240V)*	West Germany
KU	–	○	AC120V only	U.S.A.
KC	–	○	AC120V only	Canada
S	○	–	AC110V/120V/220V/240V (switchable)	General market

*Change the primary wiring of the power transformer.

- This service manual is applicable to the HE type. For servicing of the HB, KU and HEZ types, please refer to pp. 57-66. For servicing of the other types, please refer to the additional service manual.
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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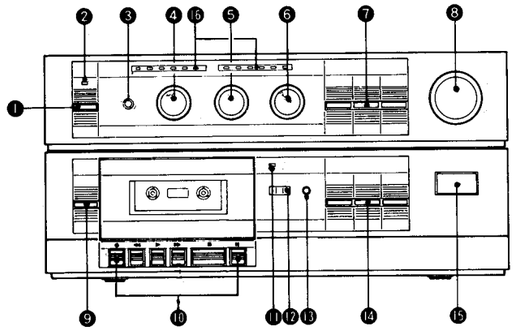
1. FRONT PANEL FACILITIES



❶ POWER SWITCH

NOTE:
When this switch is pushed to ON or OFF, the power meter may light. This is not, however, a failure or malfunction.

❷ POWER INDICATOR

❸ HEADPHONES JACK

❹ BASS CONTROL

❺ TREBLE CONTROL

❻ BALANCE CONTROL

❼ FUNCTION SWITCHES

TAPE (⌀⌀) : Push when playing back tapes.
TUNER (⫼) : Push when listening to broadcast on the tuner.
PHONO (◎) : Push when playing records on the turntable.

❽ VOLUME CONTROL

❾ EJECT BUTTON

Push this button to open the cassette door.

❿ OPERATION SWITCHES

● (Rec) : Push this switch to start recording. When depressed to the ON position, the Rec indicator lights. The switch does not work when a cassette is not loaded or when the erasure prevention tabs of a loaded cassette have been broken off.
◀◀ (REW) : Push this switch to rewind the tape quickly.
▶ (Play) : Push this switch to start tape playback.
▶▶ (FF) : Push this switch to sent the tape forward quickly.
■ (Stop) : Push this switch to stop the tape running and to release the function switches.
❚❚ (Pause) : Push this switch to stop the tape temporarily. Release it to resume running.
The tape does not stop during fast forward or rewind operations even when the ❚❚ (pause) switch is pushed.

⓫ REC INDICATOR

This lights during the recording mode.

⓬ TAPE COUNTER

⓭ RESET BUTTON

Push this button to reset the tape counter display to 000.

⓮ TAPE SELECTOR

These selectors allow the tape's bias and equalization characteristics to be selected during recording and the equalization characteristics during playback, in line with the type of tape being used.
METAL : Push when using the METAL tape.
CrO_2 : Push when using the CrO_2 tape.
NORMAL : Push when using the NORMAL tape.

⓯ *DOLBY NR SWITCH

Push this switch to ON when recording with the built-in Dolby noise reduction system and when playing back tapes which have been recorded using the system.

*Noise Reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

⓰ POWER METER

2. SPECIFICATIONS

DC-200Z/DC-201Z
AMPLIFIER SECTION

Continuous Average Power Output is 40 watts* per channel, min., at 8 ohms from 40 Hertz to 20,000 Hertz with no more than 0.3% total harmonic distortion.

**Measured pursuant to the federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.*

Continuous Power Output
40 to 20,000Hz . . . . . 40W + 40W (T.H.D. 0.3%, 8Ω)
1kHz (DIN) . . . . . 50W + 50W (T.H.D. 1%, 8Ω)
Hum and Noise (IHF, short-circuited, A network)
PHONO 72dB
Hum and Noise (DIN continuous Power/50mV)
PHONO 68dB/60dB
Total Harmonic Distortion (40Hz to 20,000Hz, 8 ohms, from TUNER)
Continuous rated power output . . . . . No more than 0.3%
20 watts per channel power output
. . . . . No more than 0.2%

Tape Deck Section

Systems . . . . . 4 track, 2-channel stereo
Heads . . . . . "Hard Permalloy" recording/playback head x 1
"Ferrite" erasing head x 1
Motor . . . . . DC servo motor x 1
Wow and Flutter . . . . . No more than 0.06% (WRMS)
No more than ±0.18% (DIN)
Fast Winding Time . . . . . Approximately 110 seconds (C-60 tape)
Frequency Response
–20dB recording:
Normal tape . . . . . 35 to 13,000Hz
Chrome tape . . . . . 35 to 14,000Hz
Metal tape . . . . . 35 to 15,000Hz
Signal-to-Noise Ratio
Dolby NR OFF . . . . . More than 57dB
Noise Reduction Effect
Dolby NR ON . . . . . More than 10dB (at 5kHz)
Harmonic Distortion . . . . . No more than 1.5% (0dB)

Furnished Parts

Operating instructions 1

Miscellaneous

Power requirements
KU and KC models AC120V, 60Hz
HE model AC220V, 50/60Hz
HB and HP models AC240V, 50/60Hz
S and S/G models . . . . . AC110V/120V/220V/240V, 50/60Hz (switchable)

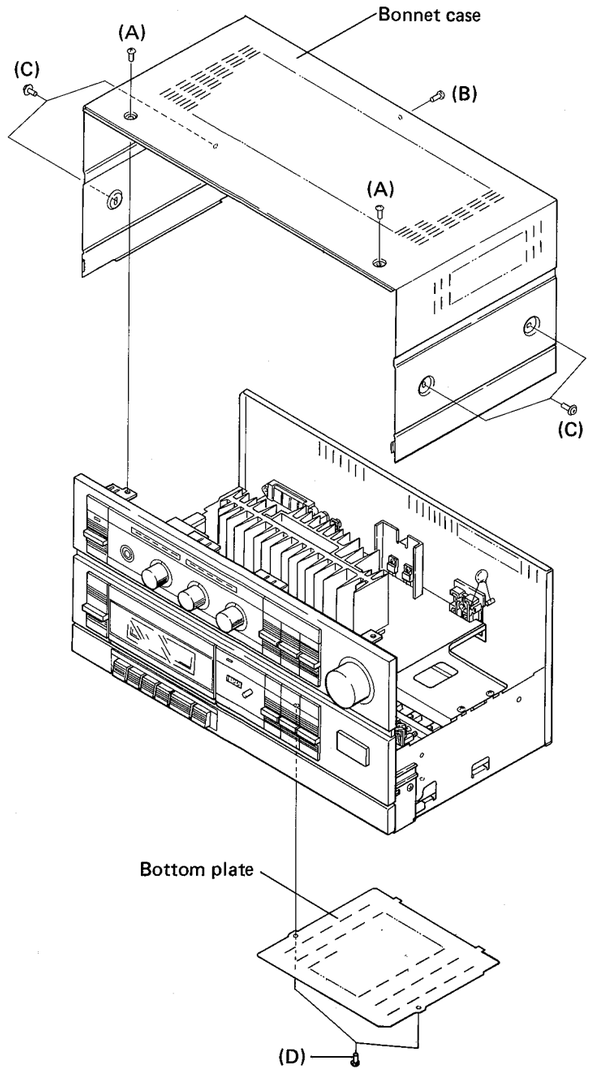
Power Consumption

KU model 105W
KC model 182W
HE, HB and HP models 270W
S and S/G models 96W
Dimensions . . . . . 420 (W) x 210 (H) x 248 (D)mm
Weight (without package) 7.7kg

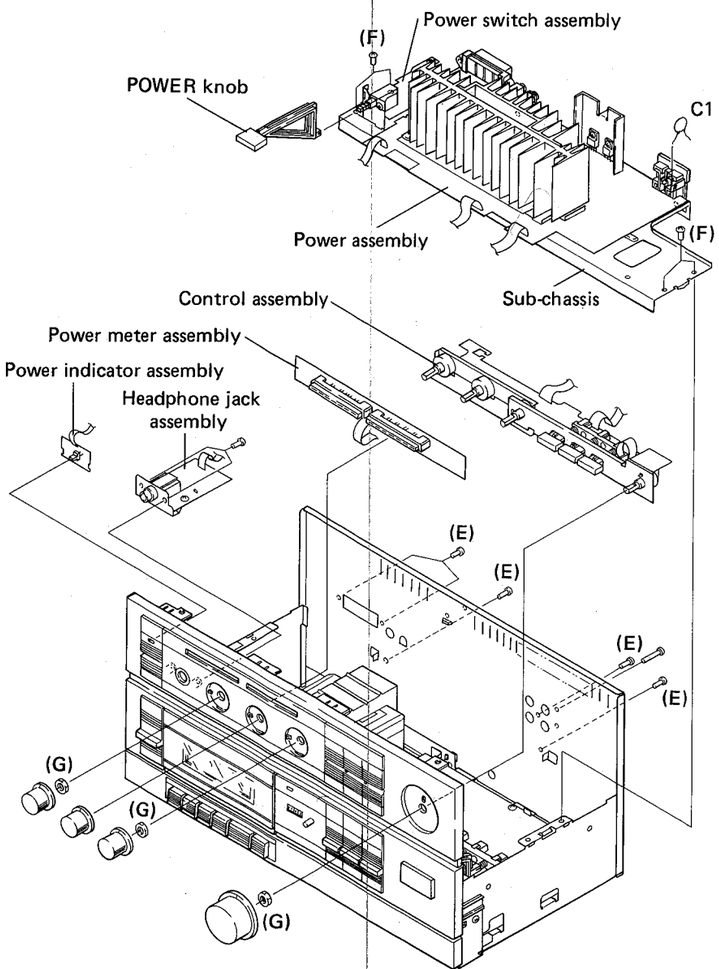
NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

3. DISASSEMBLY

- **Bonnet Case**
  Remove screws (A) (top side), screw (B) (rear side) and screws (C) (left and right side).
- **Bottom Plate**
  Remove screws (D) (bottom side).

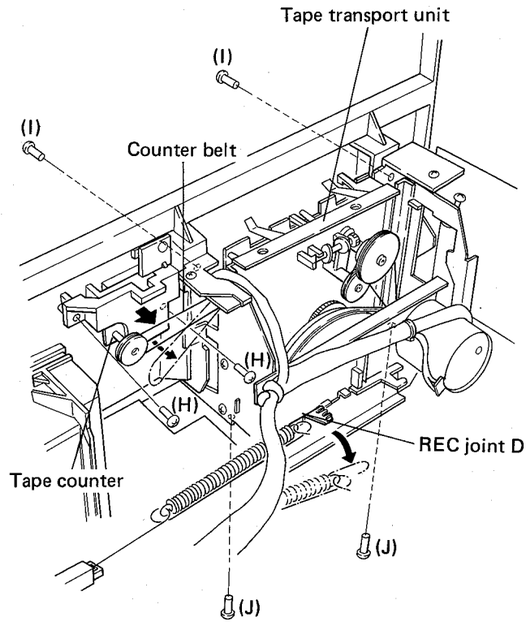


- **Sub-chassis (Power Assembly, Power Switch Assembly)**
  Disconnect C1 (ceramic capacitor). Remove POWER knob. Remove screws (E) (rear side) and screws (F) (upper side).



- **Control Assembly**
  Pull off the knobs (VOLUME, BALANCE, TREBLE and BASS). Remove nuts (G) (control shafts).

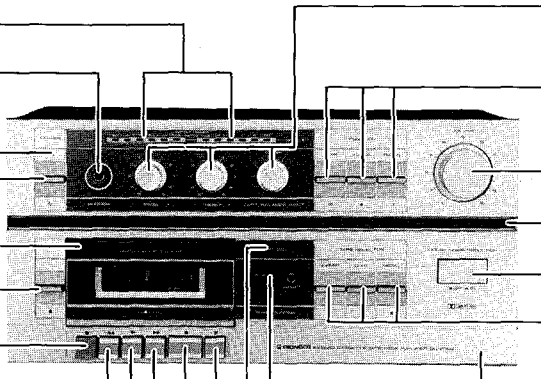
- **Tape Counter**
  Remove Sub-chassis. Remove the counter belt. Remove screws (H).
- **Tape Transport Unit**
  Remove Sub-chassis. Remove the counter belt and REC joint D. Remove screws (I) (front side) and screws (J) (bottom side).



4. PARTS LOCATION

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel View



★ LED array
LN12256P1

Phone jack (PHONES)
RKN-091

★ LED (POWER)
LN217RP

Knob (POWER)
RAC-386

★★ Door assembly
RXX-451 (for DC-200Z)
RXX-455 (for DC-201Z)

Knob (EJECT)
RAC-387

Knob (REC)
RAC-402

Knob
(PLAY, FF, REW)
RAC-390

Knob (STOP)
RAC-391

Knob (PAUSE)
RAC-390

Knob
(BASS, TREBLE, BALANCE)
RAD-243

Knob
(TAPE, TUNER, PHONO)
RAC-388

Knob (VOLUME)
RAA-395

Front cover
RNL-835

Knob (DOLBY NR)
RXX-453

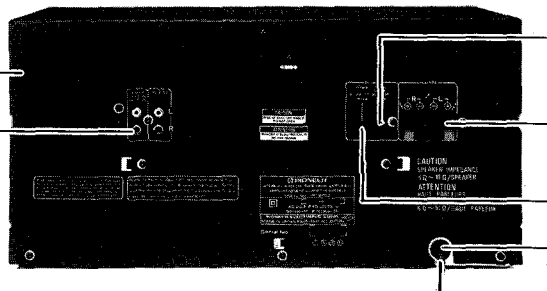
Knob
(TAPE SELECTOR)
RAC-389

Front panel
RNT-041 (for DC-200Z)
RNT-042 (for DC-201Z)

Tape counter
RAW-204

★ LED (REC)
LN217RP

Rear Panel View



Bonnet case
RNA-632

Terminal (INPUT)
RKB-022

⚠ Terminal
(DC OUT TURNTABLE)
RKN-090

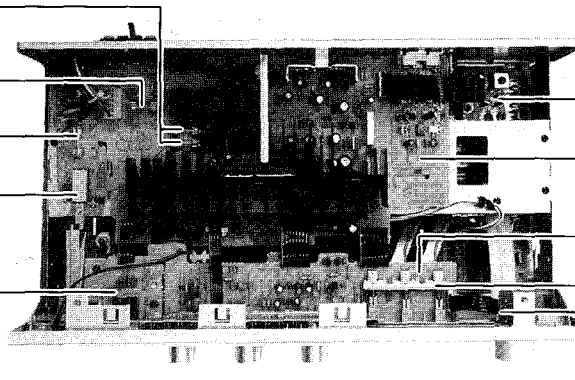
Terminal
(SPEAKERS)
RKC-067

⚠ Terminal
(DC OUT TUNER)
RKN-089

⚠ Strain relief
REC-396

⚠ AC power cord
RDG-027

Top View



⚠★★ Fuse
(T2.5A, FU501, FU601)
REK-054

⚠★★ Fuse (T1.6A, FU701)
REK-069

⚠★★ Fuse
(T1.25A, FU801)
REK-070

⚠★★ Push switch (POWER)
RSA-063

Headphone jack assembly

Deck assembly

Power assembly

Control assembly

★★ Push switch assembly B
RSG-157

Level control assembly

5. EXPLODED VIEW

Exterior

- *Parts without part number cannot be supplied.*
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  ★★ GENERALLY MOVES FASTER THAN ★.
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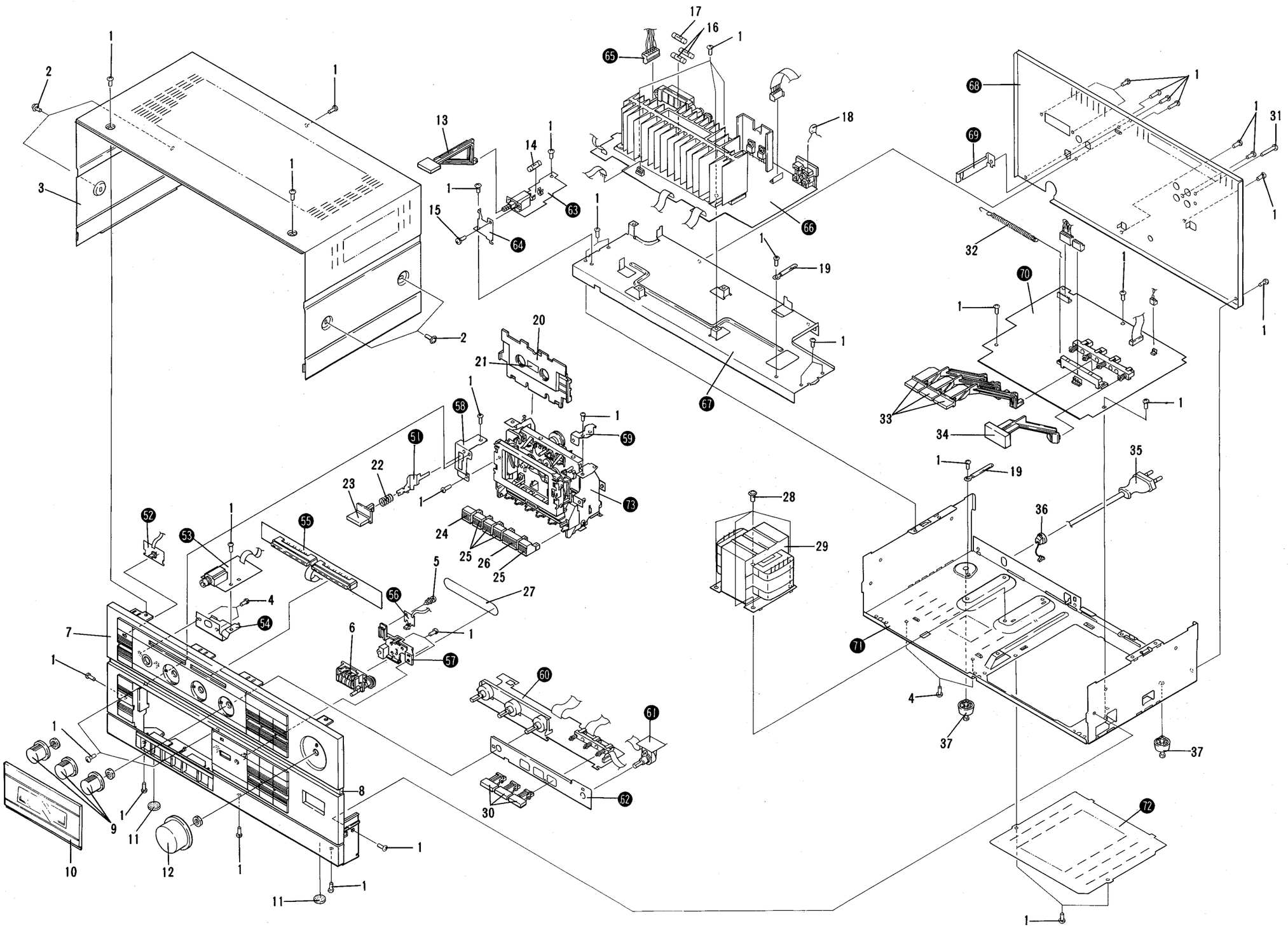
Parts List of Exterior

Mark	No.	Part No.	Description
	1.	BBZ30P080FZK	Screw 3 x 8
	2.	ATZ40P080FZK	Screw 4 x 8
	3.	RNA-632	Bonnet case
	4.	BBZ30P060FMC	Screw 3 x 6
	5.	RBM-003	Nylon rivet
	6.	RAW-204	Tape counter
	7.	RNT-041	Front panel (for DC-200Z)
		RNT-042	Front panel (for DC-201Z)
	8.	RNL-835	Front cover
	9.	RAD-243	Knob (BALANCE, BASS, TREBLE)
★★	10.	RXX-451	Door assembly (for DC-200Z)
		RXX-455	Door assembly (for DC-201Z)
	11.	REC-355	Skid
	12.	RAA-395	Knob (VOLUME)
	13.	RAC-386	Knob (POWER)
⚠★★	14.	REK-070	Fuse (T1.25A, FU801)
	15.	PMA30P060FMC	Screw 3 x 6
⚠★★	16.	REK-054	Fuse (T2.5A, FU501, FU601)
⚠★★	17.	REK-069	Fuse (T1.6A, FU701)
	18.	CKDYF 473Z 50	Ceramic capacitor (C1)
	19.	RNE-513	UL cord clamper
	20.	RNL-838	Cassette plate
	21.	REE-081	Shining paper
	22.	RBH-750	Eject spring
	23.	RAC-387	Knob (EJECT)
	24.	RAC-402	Knob (REC)
	25.	RAC-390	Knob (PLAY, FF, REW, PAUSE)
	26.	RAC-391	Knob (STOP)
★★	27.	REB-512	Counter belt
	28.	ATZ40P080FMC	Screw 4 x 8
⚠ ★	29.	RTT-367	Power transformer (220/240V)
	30.	RAC-388	Knob (TAPE, TUNER, PHONO)
	31.	RBA-090	Screw with bar
	32.	RBH-934	REC joint D
	33.	RAC-389	Knob (TAPE SELECTOR)
	34.	RXX-453	Knob (DOLBY NR)
⚠	35.	RDG-027	AC power cord
⚠	36.	REC-396	Strain relief
	37.	REC-369	Foot assembly
		REC-371	Cord binder
	51.		Eject plate
	52.		Power indicator assembly
	53.		Headphone jack assembly
	54.		Jack holder
	55.		Power meter assembly
	56.		REC indicator assembly
	57.		Counter holder
	58.		Mechanism holder L
	59.		Mechanism holder R
	60.		Control assembly
	61.		Level control assembly
	62.		Shield plate
	63.		Power switch assembly
	64.		Switch holder
	65.		Connector assembly
	66.		Power assembly
	67.		Sub-chassis
	68.		Rear panel
	69.		Holder
	70.		Deck assembly
	71.		Chassis
	72.		Bottom plate
	73.	Refer to pp. 11-14	Tape transport unit

Exterior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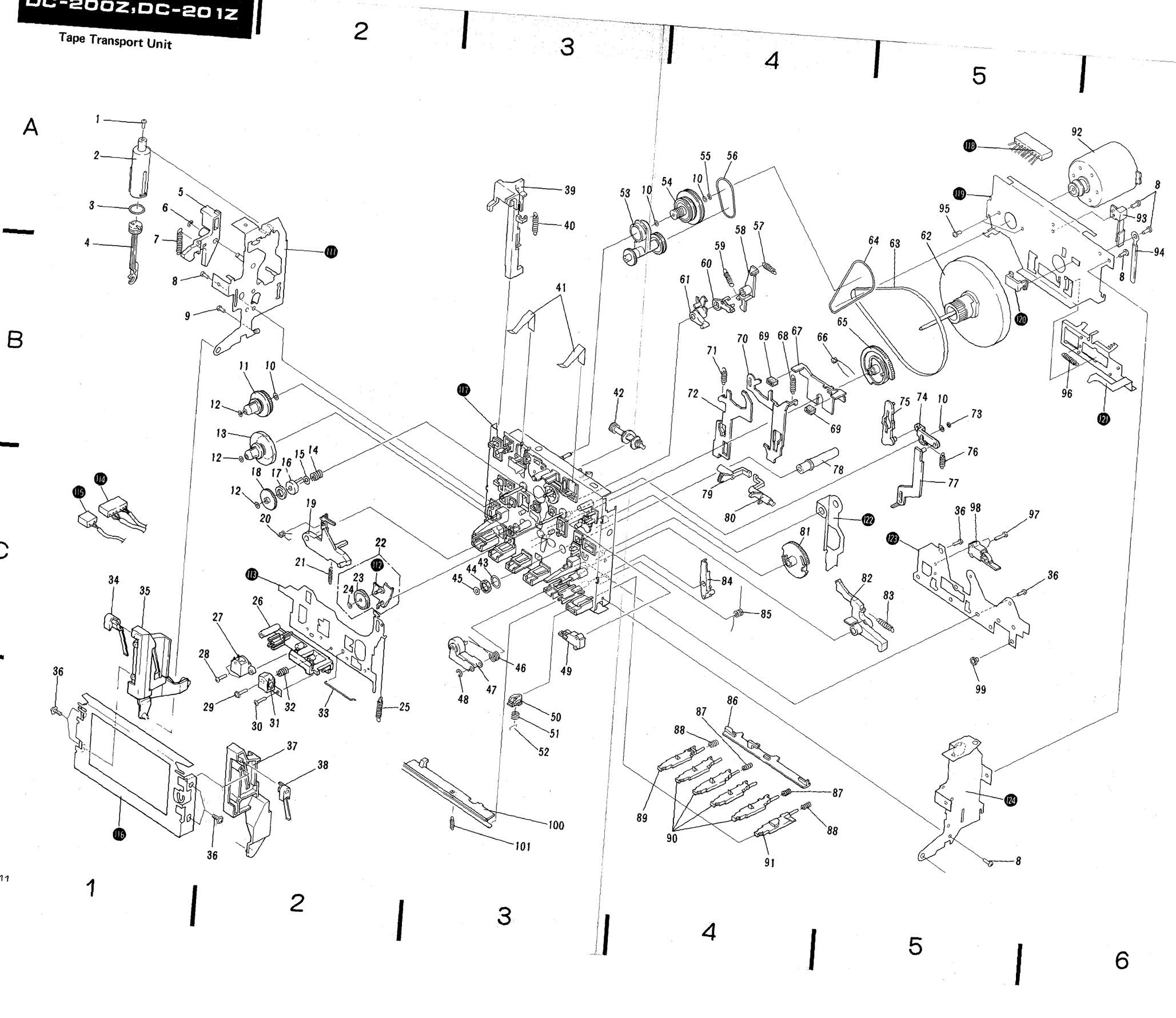
DC-200Z,DC-201Z

Tape Transport Unit



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ *GENERALLY MOVES FASTER THAN* ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List of Tape Transport Unit

Mark	No.	Part No.	Description
	1.	VCZ26P090FMC	Screw 2.6 x 9
	2.	RNK-995	Cylinder
	3.	REB-447	O-ring
	4.	RNL-329	Piston
	5.	RNL-291	Eject lever
	6.	YE25FUC	Washer E-type
	7.	RBH-871	Pocket return spring
	8.	VCZ26P060FMC	Screw 2.6 x 6
	9.	PSZ20P060FMC	Screw 2 x 6
	10.	WA21D040D25	Washer
★★	11.	RXB-377	Supply reel base assembly
	12.	RBF-057	Washer
★★	13.	RXB-360	TU reel base assembly
	14.	RBH-885	Detector spring
	15.	RBF-071	Washer
	16.	RNL-318	Detector disk
	17.	RED-194	Detector felt
	18.	RNK-998	Idler gear
	19.	RNL-298	Action lever
	20.	RBH-873	Idler pressure spring
	21.	RBH-875	Action lever spring
	22.	RXB-579	Idler arm full assembly
★★	23.	RNL-337	TU idler
	24.	WA17D040D025	Washer
	25.	RBH-874	HB return spring
	26.	RNL-050	Sub-head base
★	27.	RPB-085	Erase head
	28.	PMZ20P130FMC	Screw 2 x 13
	29.	iMZ20Y120FMC	Screw 2 x 12
	30.	PMZ20P120FMC	Screw 2 x 12
★★	31.	RPB-118	REC/PB head
	32.	RBH-723	Head adjust spring
	33.	RBH-782	HB drive spring
	34.	RNL-057	Pocket spring L
	35.	RNL-439	Pocket L
	36.	BBZ26P080FZK	Screw 2.6 x 8
	37.	RNL-440	Pocket R
	38.	RNL-058	Pocket spring R
	39.	RNL-284	REC detector arm
	40.	RBH-883	Detector arm spring
	41.	RBK-166	Half set spring
	42.	RNL-322	Cam gear
	43.	RBE-021	Washer
	44.	NK90FCr	Nut
	45.	RBF-030	Oil stopper
	46.	RBH-890	Pinch pressure spring
★★	47.	RXB-495	Pinch arm assembly
	48.	YE20FUC	Washer E-type
★★	49.	RSN-034	Lever switch (S1)
	50.	RNL-334	Ratcher holder
	51.	RBH-888	Ratcher spring
	52.	RBH-870	Ratchet pin
	53.	RXB-577	Drive arm full assembly
	54.	RXB-976	Drive pulley assembly
	55.	YE15FUC	Washer E-type
★★	56.	REB-455	Drive belt B
	57.	RBH-876	Gear lever spring A
	58.	RNL-297	Gear lever A
	59.	RBH-877	Gear lever spring B
	60.	RNL-282	Gear lever B
	61.	RNL-296	Gear lever C
	62.	RXB-576	Flywheel assembly
★★	63.	REB-453	Capstan belt
★★	64.	REB-454	Drive belt A
	65.	RNL-288	Cam gear
	66.	RBH-879	Trigger spring
	67.	RNL-280	Brake plate
	68.	RBH-884	Action plate spring
	69.	REB-466	Brake shoe
	70.	RNL-811	FF action plate
	71.	RBH-916	Action plate spring L
	72.	RNL-810	REW action plate
	73.	YS20FBT	Washer C-type
	74.	RNL-275	Link
	75.	RNL-274	Detector lever
	76.	RBH-886	Link return spring
	77.	RNL-289	Stop lever
	78.	RXB-670	Metal holder A assembly
	79.	RNL-812	Joint L
	80.	RNL-276	Joint R

Mark	No.	Part No.	Description
	81.	RNL-831	Cam gear R
	82.	RNL-295	Pause lever
	83.	RBH-880	Pause lever spring
	84.	RNL-281	Gear lever R
	85.	RBH-881	Trigger spring R
	86.	RNL-486	REC connection arm
	87.	RBH-889	Button return spring
	88.	RBH-909	Pause button spring
	89.	RNL-487	REC button
	90.	RNL-287	Function button
	91.	RNL-279	Pause button
★★	92.	RXM-088	Motor with pulley
★★	93.	RSN-025	Spring switch (S3)
	94.	RNE-605	UL cord clamper D
	95.	PMA26P040FMC	Screw 2.6 x 4
	96.	RBH-882	REC return spring
	97.	PMZ20P080FMC	Screw 2 x 8
★★	98.	RSN-033	Lever switch (S2)
	99.	RLB-469	Collar
	100.	RNL-303	Lock plate
	101.	RBH-922	Lock plate spring
		REC-371	Cord binder

Mark	No.	Part No.	Description
	111.		Side plate L assembly B
	112.		Idler arm assembly
	113.		Head base
	114.		Connector assembly 6-P
	115.		Connector assembly 2-P
	116.		Pocket frame B
	117.		Chassis assembly
	118.		Connector socket 9-P
	119.		Flywheel receptacle
	120.		Thrust receptacle
	121.		REC action plate
	122.		REC action lever
	123.		Plate
	124.		Side plate R
	125.	.....	

6. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 x 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 x 10³*	*473*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 x 10¹*	*5621*	*RN¼SR 5 6 2 1 F*

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  ★★ GENERALLY MOVES FASTER THAN ★.

  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

Miscellaneous Parts

FUSES

Mark	Symbol & Description		Part No.
⚠★★	FU501, FU601	Fuse (T2.5A)	REK-054
⚠★★	FU701	Fuse (T1.6A)	REK-069
⚠★★	FU801	Fuse (T1.25A)	REK-070

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Deck assembly	Non supply
	REC indicator assembly	Non supply
	Power assembly	Non supply
	Control assembly	Non supply
	Level control assembly	Non supply
	Headphone jack assembly	Non supply
	Power switch assembly	Non supply
	Power indicator assembly	Non supply
	Power meter assembly	Non supply

SWITCHES (on the tape transport unit)

Mark	Symbol & Description		Part No.
★★	S1	Lever switch (PLAY)	RSN-034
★★	S2	Lever switch (FF)	RSN-033
★★	S3	Spring switch (REC)	RSN-025

OTHERS

Mark	Symbol & Description		Part No.
⚠ ★	T1	Power transformer (220/240V)	RTT-367
⚠		AC power cord	RDG-027
★★		Motor with pulley	RXM-088
★★		REC/PB head	RPB-118
★		Erase head	RPB-085
	C1	Ceramic capacitor	CKDYF 473Z 50

Deck Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q307	HA12045
★★	Q101, Q102, Q201, Q202	2SC2240
★★	Q103–Q107, Q203–Q207, Q304, Q305	2SC1740LN
★★	Q303	2SC1741
★★	Q301, Q302	2SC1740LN-S
★★	Q306	2SA933LN
★★	Q308	M5218L
★	D312	RD5.1EB2 (MTZ5.1B)
★	D301–D308, D310, D311, D313	1S2473
★	D101, D201	1K60AUF

COILS, FILTERS

Mark	Symbol & Description		Part No.
	L301	Oscillator coil	RTD-032
	L302	Line coil	RTF-101
	L101, L201	MPX filter	RTF-138
	L102, L202	Peaking coil	RTF-629
	L103, L203	Trap coil	RTF-152

SWITCHES

Mark	Symbol & Description		Part No.
★★	S301–S304	Push switch assembly (S301–S303: TAPE SELECTOR, S304: DOLBY NR)	RSG-158
★★	S305	Slide switch (Recording/playback)	RSH-048

CAPACITORS

Mark	Symbol & Description	Part No.
	C122, C222	CEA R27M 50
	C129, C229	CEA R33M 50
	C123, C223	CEA R82M 50
	C118, C125, C126, C130, C218, C225, C226, C230, C310	CEA 010M 50
	C114, C124	CEA 2R2M 50
	C106, C107, C110, C117, C128, C206, C207, C210, C217, C228	CEA 100M 16
	C313, C314	CEA 220M 16
	C302	CEA 4R7M 50
	C109, C209, C315, C320, C321	CEA 330M 16
	C103, C203, C113, C213, C303, C319	CEA 470M 16
	C116, C301, C311, C312	CEA 101M 16
	C317, C318, C322	CEA 221M 16
	C304	CEA 221M 10
	C121, C221	CEANL 4R7M 50
	C102, C112, C115, C202, C212, C215	CEANL 100M 16
	C307, C308	CQMA 332K 50
	C309	CQMA 682K 50
	C120, C220	CQMA 472J 50
	C133, C233	CQMA 562J 50
	C132, C232	CQMA 682J 50
	C131, C231	CQMA 822J 50
	C105, C205	CQMA 103J 50
	C108, C208, C306	CQMA 153J 50
	C124, C224	CQMA 183J 50
	C119, C219	CQMA 333J 50
	C305	CQPA 562J 100
	C104, C204	CCPSL 220J 50
	C134, C234	CCDSL 471K 50
	C127, C227	CCDSL 271J 50
	C135, C235	CCDSL 101K 500
	C111, C211	CCDSL 271J 50
	C316	CKDYF 473Z 50
	C101, C201	CQSA 471J 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description		Part No.
★	V101, V102, V201, V202	Semifixed (22k-B)	RCP-223
★	V103, V203	Semifixed (150k-B)	RCP-228
	R101, R201		RD¼PM 753JNL
	R102–R109, R113, R115–R117, R119, R120, R122, R202–R209, R213, R215–R217, R219, R220, R222, R314		RD¼PM □□□J
	Other resistors		RD1/6PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Shield case	RNH-209

REC Indicator Assembly

LED

Mark	Symbol & Description	Part No.
★	D401 (REC)	LN217RP

Power Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠★★	Q705	STK4171-2S
★★	Q706	NJM4558DX
★★	Q703	2SC1740LN
★★	Q704, Q707	2SA933LN
⚠★★	Q701, Q702	2SD1276
⚠ ★	D701	RB-402LF-F
⚠ ★	D702	RB-152LF-F
⚠ ★	D705 (Triac)	BCR6AM-8L
⚠ ★	D703, D704	10E2FD
⚠ ★	D712	RD13FB3
⚠ ★	D713	MTZ15A (RD15EB1)
⚠ ★	D710	MTZ13B (MTZ13C) (RD13EB2) (RD13EB3)

Mark	Symbol & Description	Part No.
⚠ ★	D711	1SR35-100A
★	D501, D503, D601, D603, D706, D707, D709	1S2473
★	D708	RD2.7EB1 (RD2.7EB2)

COILS

Mark	Symbol & Description		Part No.
	L501, L601	AF choke coil	RTH-003

CAPACITORS

Mark	Symbol & Description		Part No.
	C715, C716	Electrolytic (4700/50)	RCH-059 (RCH-061)
	C722		CEA 102M 35
	C713		CEA 471M 6R3
	C710		CEA 221M 16
	C712		CEA 221M 10
	C707		CEA 101M 50
	C725		CEA 101M 35
	C731		CEA 101M 25
	C514, C614, C704, C705, C726		CEA 470M 25
	C723		CEA 470M 16
	C505, C605		CEA 470M 10
	C724, C727		CEA 100M 16
	C706, C708, C709, C711		CEA 100M 50
	C721		CEA 2R2M 50
	C508, C608		CEA 010M 50
	C502, C602		CEANL 2R2M 50
	C506, C606		CQMA 242J 50
	C507, C607		CQMA 822J 50
	C719, C720		CQMA 103K 250
	C504, C604		CCPSL 101J 50
	C503, C603		CKPYB 221K 50
	C515, C615		CKDYF 103Z 50
	C701, C702, C714		CKDYF 223Z 50
	C512, C612		CKDYX 473M 25

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
⚠	R721 Wire wound (0.22/2W x 2)	RCN-051
⚠	R509, R511, R609, R611, R704 –R706	RD¼LF □□□J
⚠	R722, R727, R729	RD½PMF □□□J
⚠	R725, R728 (Fusing)	RFA¼L □□□J
	R512–R517, R612–R617, R701 –R703, R707, R711, R712, R717 –R720, R723, R724, R730, R731	RD¼PM □□□J
	Other resistors	RD1/6PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
⚠	Terminal (DC OUT TURNTABLE)	RKN-090
⚠	Terminal (DC OUT TUNER)	RKN-089
	Terminal (SPEAKERS)	RKC-067
	Terminal (INPUT)	RKB-022
	Screw	RBA-089
	Heat proof river	RBM-013

Control Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q901, Q1001	2SC1740LN

SWITCHES

Mark	Symbol & Description	Part No.
★★	S1101–S1103 Push switch assembly B (FUNCTION)	RSG-157

CAPACITORS

Mark	Symbol & Description	Part No.
	C905, C1005	CEA 010M 50
	C902, C1002	CEA 100M 50
	C904, C1004	CEA 220M 25
	C907, C1007	CQMA 122K 50
	C908, C1008	CQMA 562K 50
	C909, C1009	CQMA 333K 50
	C910, C1010	CQMA 124K 50
	C906, C1006	CCPSL 270J 50
	C901, C903, C1001, C1003	CCPSL 101J 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR1101-VR1103 Variable resistor assembly (BASS, TREBLE, BALANCE)	RCV-116
	R901, R914, R1001, R1014	RD¼PM □□□J
	Other resistors	RD1/6PM □□□J

Level Control Assembly

Mark	Symbol & Description	Part No.
★	VR1201 Variable resistor (VOLUME)	RCV-117

Headphone Jack Assembly

Mark	Symbol & Description	Part No.
	R1301, R1401	RD¼PM 151J
	R1302, R1402	RD¼PM 181J
	Phone jack (PHONES)	RKN-091

Power Switch Assembly

Mark	Symbol & Description	Part No.
⚠	S801 Push switch (POWER)	RSA-063
⚠	C801 Ceramic capacitor (0.01/AC250V)	RCG-009

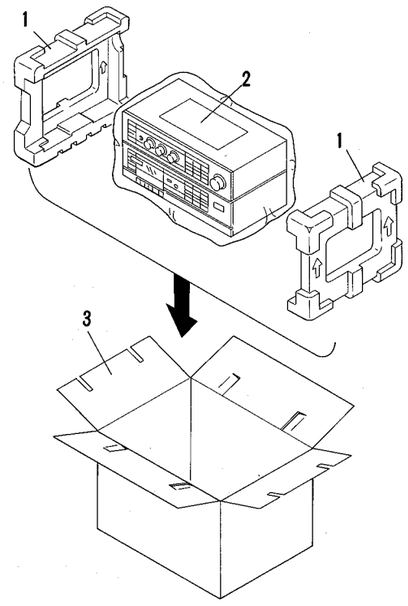
Power Indicator Assembly

LED

Mark	Symbol & Description	Part No.
★	D1501 (POWER)	LN217RP

7. PACKING

Mark	No.	Part No.	Description
	1.	RHA-261	Side pad
	2.	RRE-065	Operating instructions
	3.	RHG-744	Packing case (DC-200Z)



Power Meter Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q1601	BA4558
★★	Q1701, Q1801	BA6124
★	D1701–D1706, D1801–D1806 (LED array)	LN12256P1

CAPACITORS

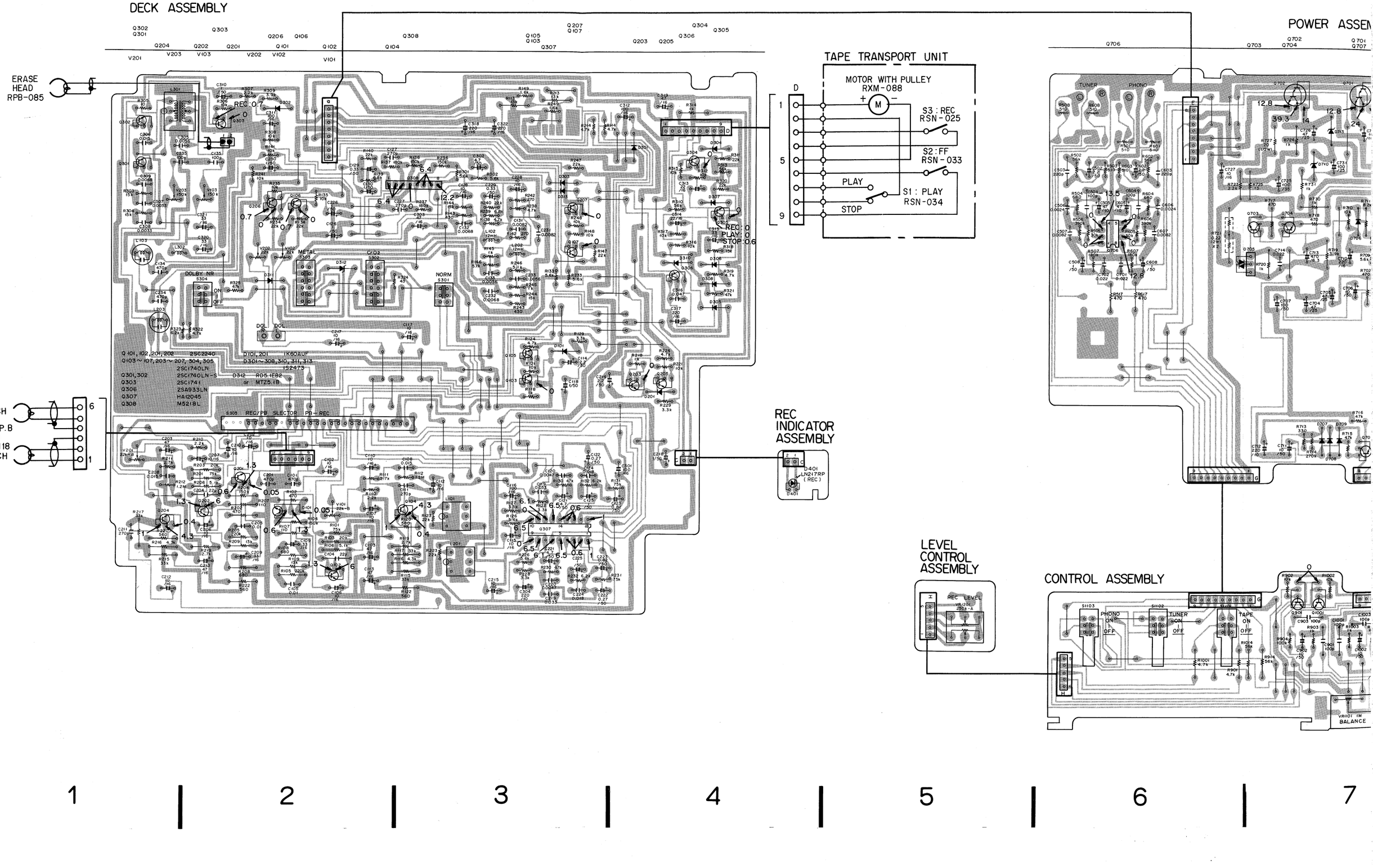
Mark	Symbol & Description	Part No.
	C1701, C1801	CEA 010M 50
	C1702, C1802	CEA 100M 16

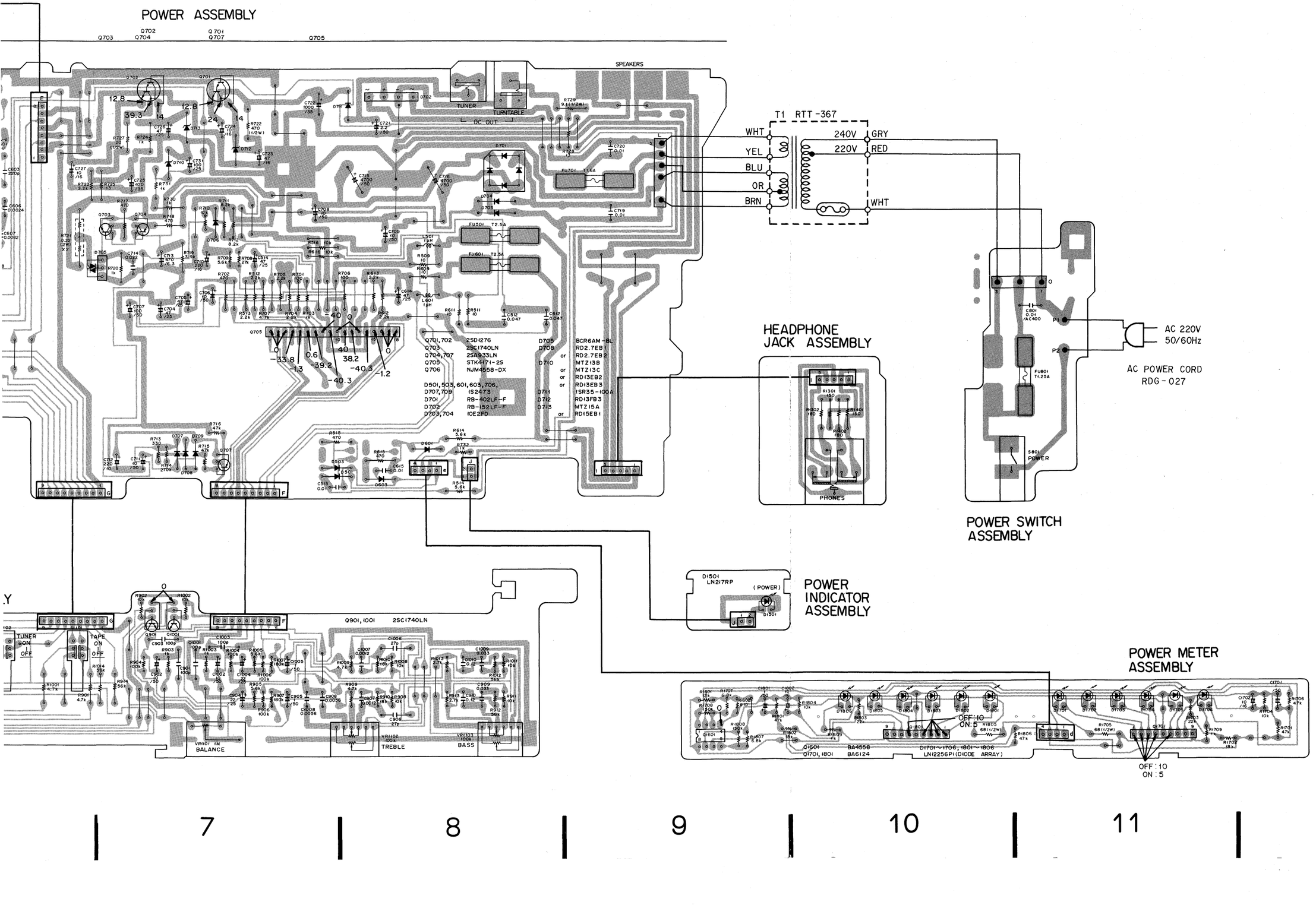
RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
⚠	R1705, R1805	RD½LF 680J
	Other resistors	RD1/6PM □□□J

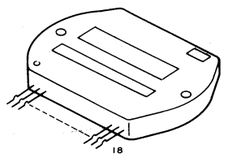
8. P.C.BOARDS CONNECTION DIAGRAM



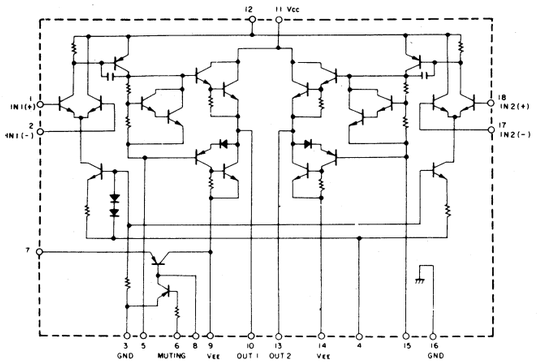

POWER ASSEMBLY
SPEAKERS
TUNER
TURNTABLE
DC OUT
T1 RTT-367
WHT
YEL
BLU
OR
BRN
240V
220V
GRY
RED
WHT
AC 220V
50/60Hz
AC POWER CORD
RDG-027
HEADPHONE
JACK ASSEMBLY
PHONES
POWER SWITCH
ASSEMBLY
POWER
INDICATOR
ASSEMBLY
D1501
LN217RP
(POWER)
POWER METER
ASSEMBLY
OFF : 10
ON : 5
TUNER
ON
OFF
TAPE
ON
OFF
VR1101 1M
BALANCE
VR1102
TREBLE
VR1103
BASS
Q901, 1001 2SC1740LN
Q1601 BA4558
Q1701, 1801 BA6124
D1701~1706, 1801~1806
LN1225GPI(DIODE ARRAY)
Q701, 702 2SD1276
Q703 2SC1740LN
Q704, 707 2SA933LN
Q705 STK4171-2S
Q706 NJM4558-DX
D501, 503, 601, 603, 706,
D707, 709 1S2473
D701 RB-402LF-F
D702 RB-152LF-F
D703, 704 10E2FD
D705 BCR6AM-8L
D708 or RD2.7EB1
RD2.7EB2
D710 or MTZ13B
MTZ13C
or RD13EB2
or RD13EB3
D711 1SR35-100A
D712 RD13FB3
D713 MTZ15A
or RD15EB1

External Appearance of Transistors and ICs

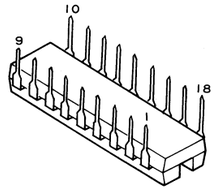
STK4171-2S



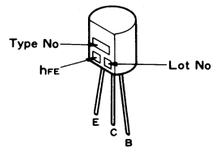
Equivalent circuit of STK4171-2S



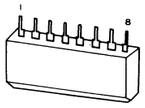
HA12045



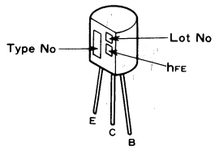
2SA933LN
2SC1740LN



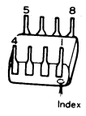
M5218L



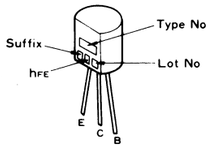
2SC2240



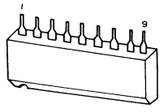
NJM4558DX
BA4558



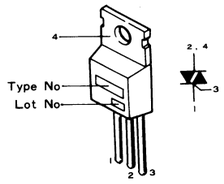
2SC1741



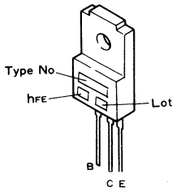
BA6124



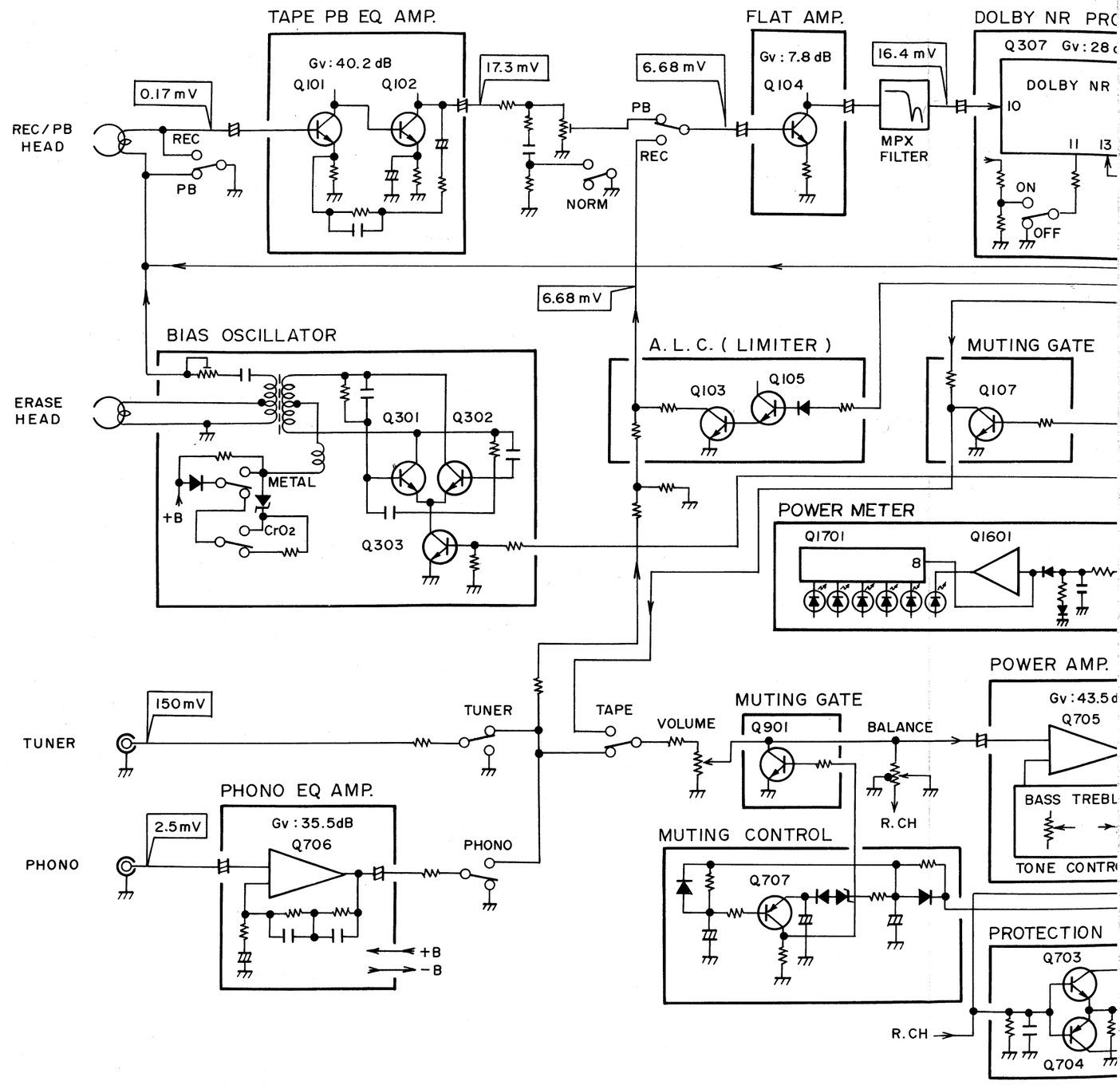
BCR6AM-8L



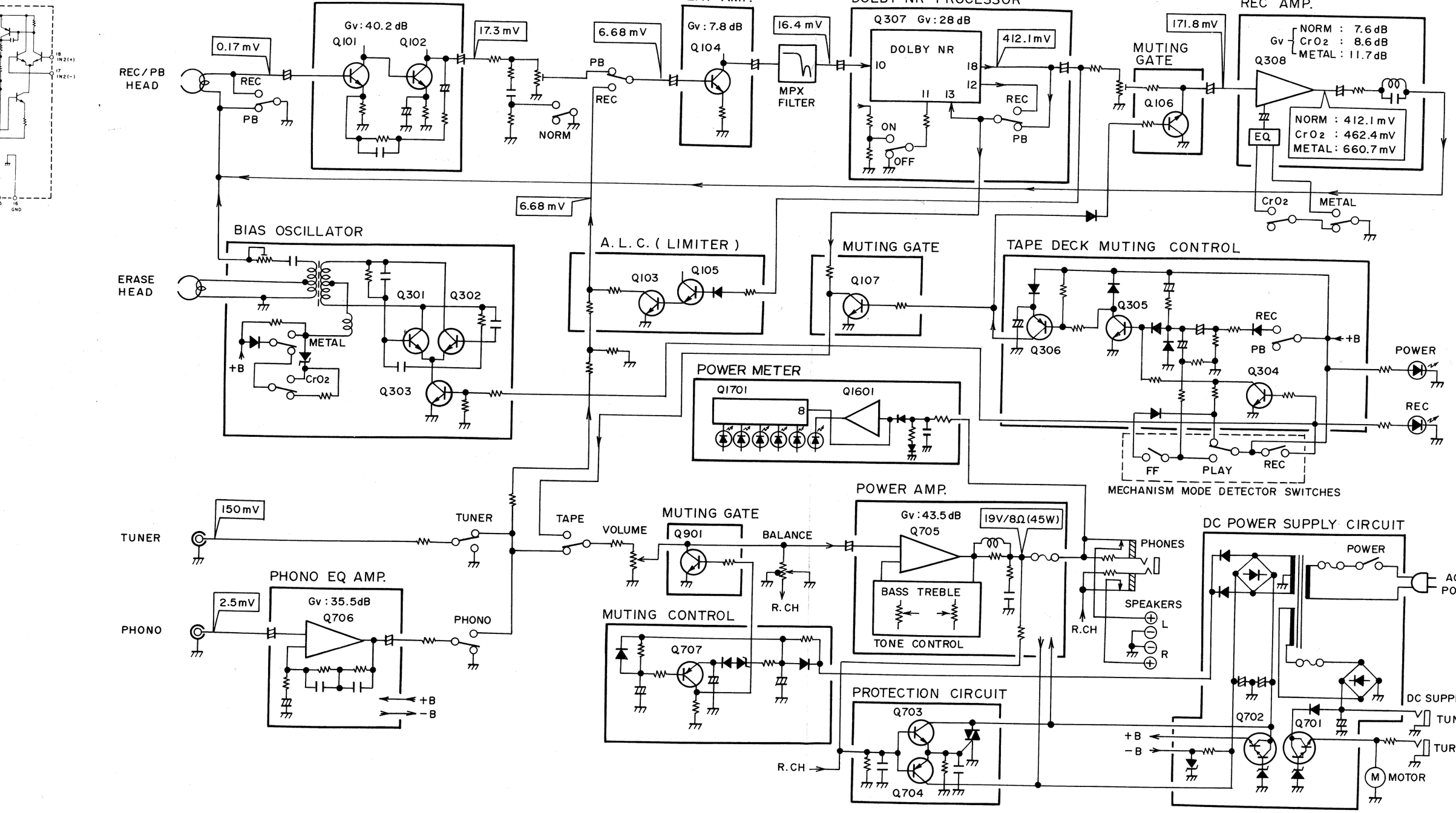
2SD1276



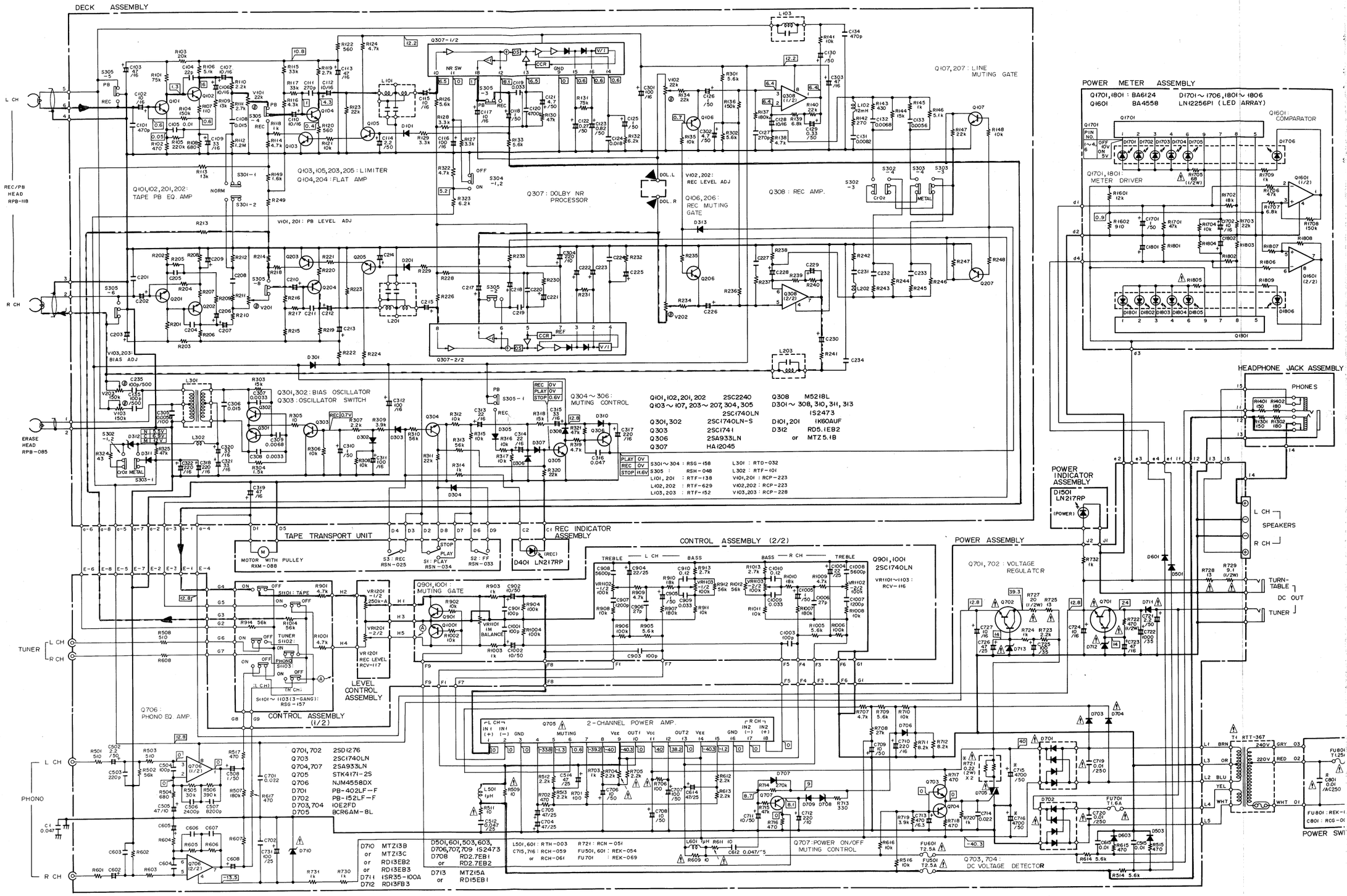
10. BLOCK DIAGRAM

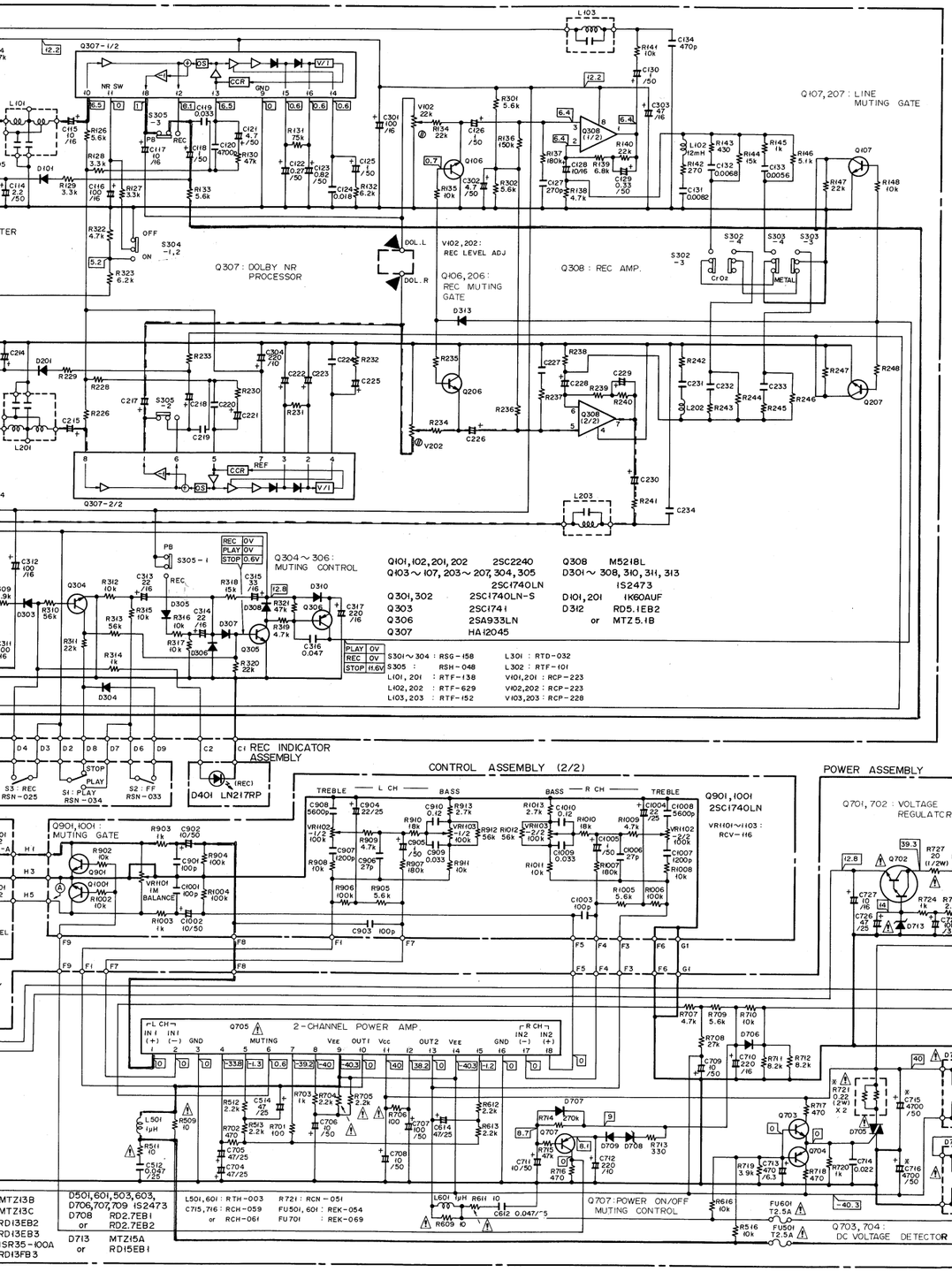


10. BLOCK DIAGRAM



9. SCHEMATIC DIAGRAM





1. RESISTORS.
Indicated in Ω, ¼W, ⅛ W,±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
; DC voltage (V) at no input signal

4. OTHERS:
➡ ; Signal route.
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:
TAPE TRANSPORT UNIT
S1 : PLAY PLAY — STOP
S2 : FF FF — OFF
S3 : REC ON — OFF
DECK ASSEMBLY
S301(2/2) : TAPE SELECTOR NORM
S302(4/4) : TAPE SELECTOR CrO2
S303(4/4) : TAPE SELECTOR METAL
NORM — CrO2 — METAL
S304(2/2) : DOLBY NR ON — OFF
S305(8/8) : REC/PB SELECTOR RECORDING — PLAYBACK
(7/8 : VACANCY)
CONTROL ASSEMBLY
S1101 : FUNCTION SELECTOR TAPE
S1102 : FUNCTION SELECTOR TUNER
S1103 : FUNCTION SELECTOR PHONO
TAPE — TUNER — PHONO
POWER SWITCH ASSEMBLY
S801 : POWER ON — OFF

The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

11. ADJUSTMENTS

11.1 MECHANICAL ADJUSTMENTS

Prior to Adjustment

Clean the both reel base, the capstan and the pinch roller with an alcohol moistened swab.

Pinch Roller Pressure Adjustment

1. Put the tape deck into the play back mode.
2. Gently push against the pinch roller arm with the tension gauge and separate the pinch roller slightly from the capstan.
3. Then the pinch roller back onto the capstan, and read the value when the pinch roller starts to rotate. If the reading fails to lie within 300g~500g, replace the pinch pressure spring.

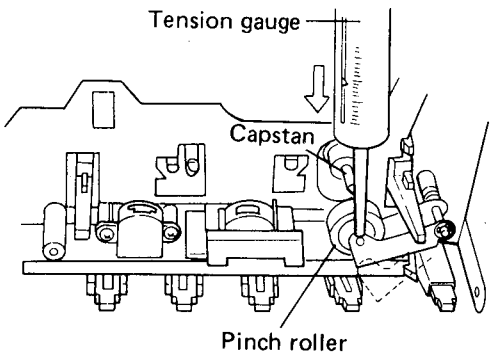


Fig. 11-1 Pinch roller pressure adjustment

Reel Base Torque Adjustment

Measure the torque with the torque meter during playback, fast forward (FF) and rewind (REW) modes. The measured values should normally lie within the allowable ranges listed in the table 1.

If the measured values lie outside the relevant ranges, replace the TU (take-up) reel base assembly and/or supply reel base assembly, TU idler, or drive arm full assembly.

Table 1

	TU reel base	Supply reel base
Playback mode	38 – 57g.cm	* 1.5 – 5g.cm
FF mode	75 – 135g.cm	* 1.5 – 5g.cm
REW mode	* 1.5 – 5g.cm	75 – 135g.cm

**Denotes back tension torque.*

REC Switch Adjustment

1. Depress REC button. REC action lever moves to A direction. At this time, check that REC switch is ON.
2. Depress STOP button. The REC action lever moves slightly to B direction. At this time, bend and adjust the REC action lever so that a contact distance of REC switch is 0.2~0.5mm.

NOTE:
Tape speed is increased by turning the semi-fixed resistor clockwise, and decreased by turning counter-clockwise.

Tape Speed Adjustment

1. Connect fhe frequency counter to the DOL. L terminal on the deck assembly.
2. Play back the 3kHz portion of the STD-301 test tape. At the beginning, the frequecny should be lie within the 3000Hz~3010Hz range, and may be adjusted by turning the semi-fixed resistor located in the capstan motor adjustment hole as shown in Fig. 11-2.

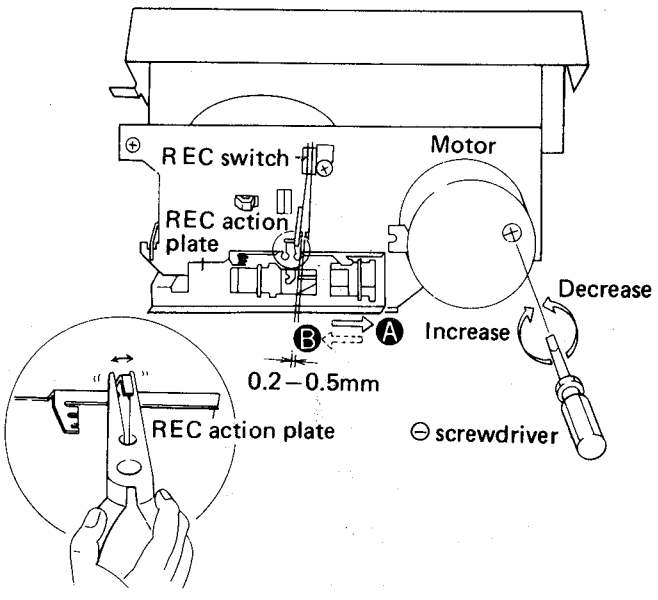


Fig. 11-2 Tape speed and REC switch adjustment

Door Dampring Check and Adjustment

1. Press the EJECT button without a cassette loaded in the cassette compartment, and check that the door opens smoothly without step-wise movement, or rebounding after fully opening.
2. If these conditions are not satisfied, adjust by turning the adjustment screw in the head of the cylinder.

REC Joint Check and Adjustment

1. Check that the gap F between the REC joint and slide switch is 0 to 0.3mm when the transport mechanism is stationary (and check that the slide switch does not move).
2. Move the REC joint mechanism catching position backwards if the gap F is greater than 1.0mm, but move it forwards if there is no gap and the slide switch is moving.
3. If the prescribed gap F cannot be obtained by the above adjustment, bend the hook section of the REC joint with a pair of pliers by an appropriate degree.
4. Check that the slide switch is fully switched when the transport mechanism is in recording mode.
5. Also check that the mechanism spring switch is shorted.

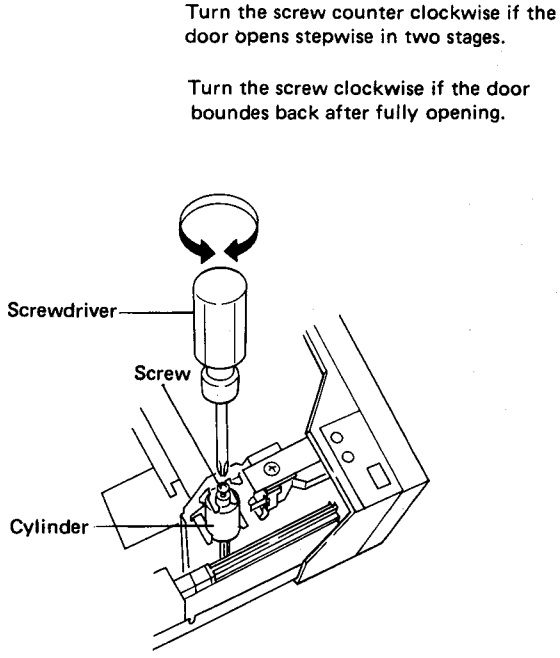

Turn the screw counter clockwise if the door opens stepwise in two stages.
Turn the screw clockwise if the door boundes back after fully opening.
Screwdriver
Screw
Cylinder

Fig. 11-3 Door damping check and adjustment

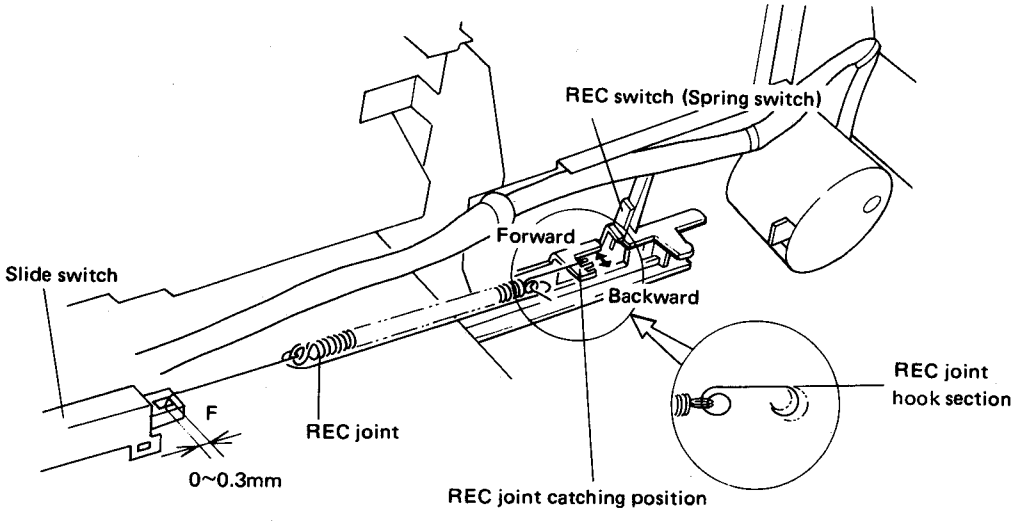


Fig. 11-4 Rec joint check and adjustment

11.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Allow the deck to age for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dBv = 1Vrms.
5. Unless otherwise specified, the switches listed below are left in the positions indicated.
   FUNCTION : TAPE
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD-331B : Playback adjustments (See Fig. 11-5)
STD-608A : NORMAL blank tape
STD-603 : CrO_2 blank tape
STD-610 : METAL blank tape

List of Adjustments

1. Head azimuth adjustment.
2. Playback equalizer check.
3. Playback level adjustment.
4. Recording and playback frequency response adjustment.
5. Recording level adjustment.
6. Limiter effect check.

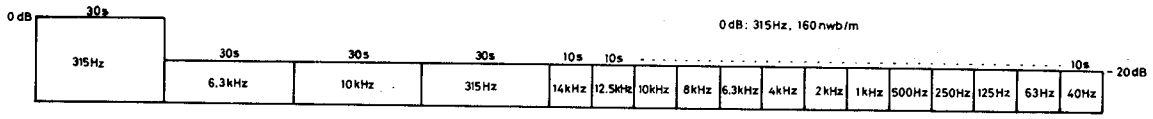


Fig. 11-5 Contents of the test tape STD-331B

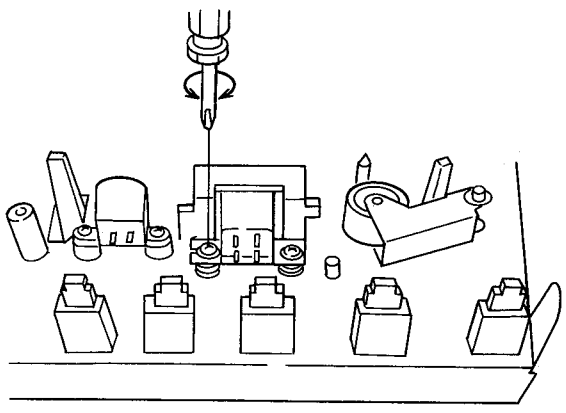


Fig. 11-6 Head azimuth adjustment

Test tape	STD-331B
Tape selector	NORM
DOLBY NR switch	OFF

• Due to "edge effect", compensate the right changed by −1dB at 40Hz and 63Hz.

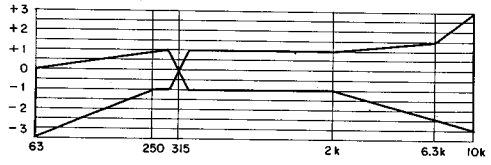


Fig. 11-7 Allowable playback frequency response zone

- Set the DOLBY NR switch to the OFF position.

1. Head Azimuth Adjustment
- Turn V101 and V201 to maximum position (fully clockwise).

	Mode	Input signal & test tape	Adjustment location	Measureing location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 10kHz/–20dB section of the STD-331B test tape.	Head azimuth adjustment screw. (See Fig. 11-6)	DOL. L (L ch.) DOL. R (R ch.)	Maximum playback signal level.	
3	STOP	Lock the screw with screw lock after completing the adjustment.				

2. Playback Equalizer Check

	Mode	Input signal & test tape	Adjustment location	Measureing location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 315Hz/–20dB and 6.3kHz/–20dB sections of the STD-331B test tape.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	The 6.3kHz playback level is –0.5± 2dB against 315Hz level.	
3	STOP	Set the TAPE SELECTOR switch to the CrO_2 or METAL position.				
4	PLAY	Play the 315Hz/–20dB and 6.3kHz/–20dB sections of the STD-331B test tape.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	The 6.3kHz playback level is –4.5± 2dB against 315Hz level.	

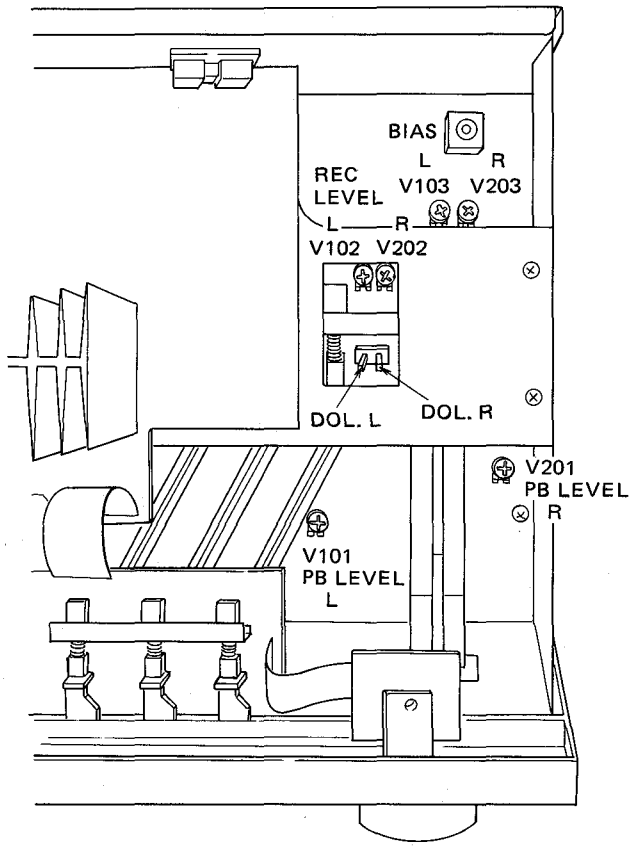


Fig. 11-8 Adjustments location

3. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 315Hz/0dB section of the STD-331B test tape.	V101 (Left channel) V201 (Right channel)	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv (412.1mV)	

4. Recording and Playback Frequency Response Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position. Set the FUNCTION switch to the TUNER position.				
2	REC-PAUSE	Apply a 315Hz/−30dBv (31.6mV) signal to the TUNER INPUT terminals.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	Approx. −27.7dBv (41.2mV)	
3	REC/PLAY	Record the above signal level onto the STD-608A test tape at 315Hz and 6.3kHz, and play back.	V103 (Left channel) V203 (Right channel)	DOL. L (L ch.) DOL. R (R ch.)	Adjust the 6.3kHz playback level to $0^{+1}_{-0.5}$dB higher than the 315Hz level.	
4		Record and play back signals up to 12kHz onto the STD-608A test tape, and check that the allowable frequency response zone shown in Fig. 11-9 is satisfied.				
5		Set the DOLBY NR switch to the ON positions. Record and play back signals up to 10kHz onto the STD-608A test tape, and check that the allowable frequency response zone shown in Fig. 11-9 is satisfied.				
6		Set the TAPE SELECTOR switch to the CrO_2 position. Record and play back signals up to 12kHz onto the STD-603 test tape, and check that the allowable frequency response zone shown in Fig. 11-10 is satisfied (for DOLBY NR ON and OFF).				
7		Set the TAPE SELECTOR switch to the METAL position. Record and play back signals up to 12kHz onto the STD-610 test tape, and check that the allowable frequency response zone shown in Fig. 11-11 is satisfied (for DOLBY NR ON, and OFF).				

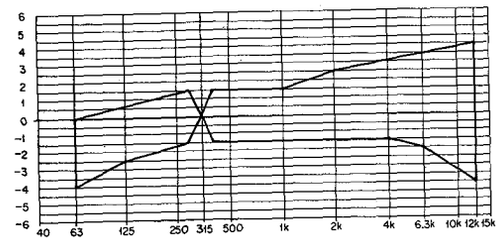
5. Recording Level Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position. Set the FUNCTION switch to the TUNER position.				
2	REC-PAUSE	Apply a 315Hz signal to the TUNER INPUT terminals.	Vary the input signal level.	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv (412.1mV)	The input signal level is approx. −10dBv.
3		Set the DOLBY NR switch to the ON position.				
4	REC/PLAY	Record the above signal level onto the STD-608A test tape, and play back.	V102 (Left channel) V202 (Right channel)	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv (412.1mV)	
5		Set the TAPE SELECTOR switch to the CrO_2 position.				
6		Record the above signal onto the STD-603 test tape, and play back.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv±1.5dB	
7		Set the TAPE SELECTOR switch to the METAL position.				
8		Record the above signal onto the STD-610 test tape, and play back.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv±1.5dB	

6. Limiter Effect Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position. Set the FUNCTION switch to the TUNER position.				
2	REC-PAUSE	Apply 1kHz signal to the TUNER INPUT terminals.	Vary the input signal level.	DOL. L (L ch.) DOL. R (R ch.)	−7.7dBv (412.1mV)	The input signal level is approx. −10dBv.
3		Increase the input signal level to +10dB higher than the level of Step 2.	Confirm	DOL. L (L ch.) DOL. R (R ch.)	−2.3dBv±1.5dB	The input signal level is approx. 0dBv.

Test tape	STD-608A
Tape selector	NORM
DOLBY NR switch	OFF



Test tape	STD-608A
Tape selector	NORM
DOLBY NR switch	ON

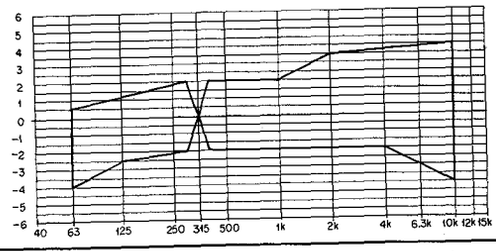
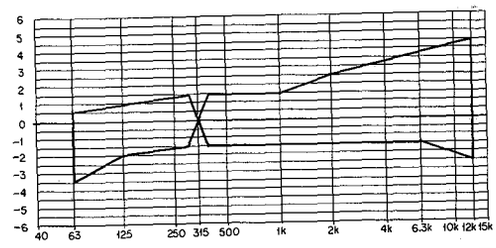


Fig. 11-9 Allowable recording and playback frequency response zone (NORM)

Test tape	STD-610
Tape selector	METAL
DOLBY NR switch	OFF



Test tape	STD-610
Tape selector	METAL
DOLBY NR switch	ON

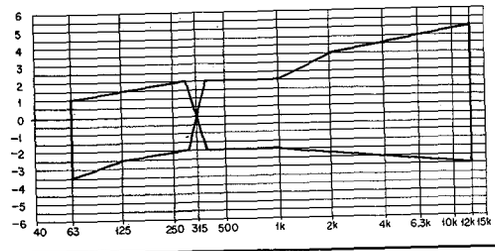
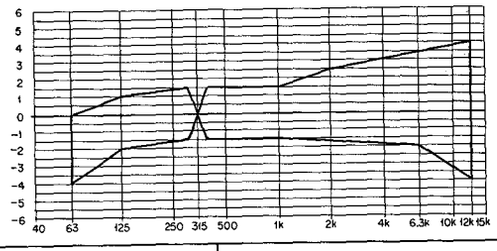


Fig. 11-11 Allowable recording and playback frequency response zpne (METAL)

Test tape	STD-603
Tape selector	CrO_2
DOLBY NR switch	OFF



Test tape	STD-603
Tape selector	CrO_2
DOLBY NR switch	ON

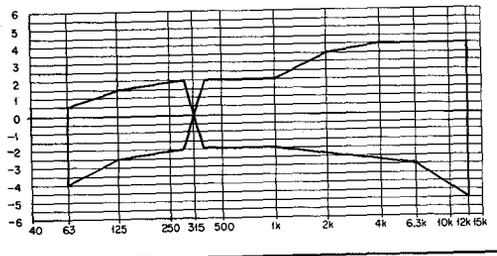


Fig. 11-10 Allowable recording and playback frequency response zone (CrO_2)

11. RÉGLAGES

11.1 RÉGLAGES DES MÉCANISMES

Avant de faire les réglages

Nettoyer les deux supports de bobine, le cabestan et le galet-presseur avec un bâtonnet imprégné d'alcool.

Réglage de pression du galet-presseur

1. Régler la platine-cassette en mode de lecture.
2. Repousser progressivement le bras supportant le galet-presseur à l'aide du tensiomètre et séparer légèrement le galet-presseur du cabestan.
3. Laisser revenir le galet-presseur contre le cabestan et interpréter la valeur indiquée dès que le galet-presseur commence à tourner. Si l'indication obtenue ne se trouve pas dans les limites de 300 à 500 gr., remplacer le ressort du galet-presseur.

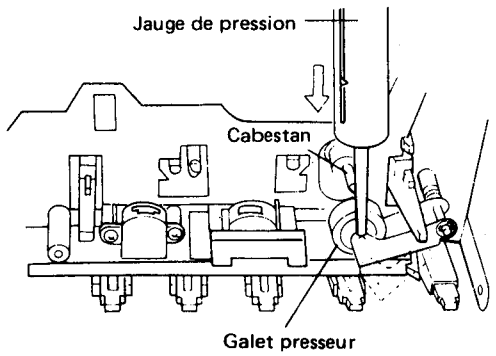


Fig. 11-1 Réglage de la force d'appui du galet presseur

Réglage du couple de support de bobine

Mesurer le coupledu support de bobine à l'aide d'un couplemètre au cours des modes de lecture, avance rapide (FF) et de retour rapide (REW). Les valeurs relevées doivent normalement se trouver dans les limites admissibles qui sont indiquées dans le tableau 1.

Si les valeurs mesurées sont en-dehors de la gamme indiquée, remplacer l'ensamble support de bobine réceptrice (TU) et/or l'ensemble support de bobine débitrice, la poulie intermédiaire TU ou l'ensemble complet du bras d'entraînement.

Tableau 1

	Support de bobine débitrice	Support de bobine réceptrice
Mode de lecture	38 à 57 gr.cm	*1,5 à 5 gr.cm
Mode d'avance rapide	75 à 135 gr.cm	*1,5 à 5 gr.cm
Mode de retour rapide	*1,5 à 5 gr.cm	75 à 135 gr.cm

** Indiquent des valeurs de contre-tension.*

Réglage du commutateur d'enregistrement "REC"

1. Appuyer sur la touche d'enregistrement (REC). Le levier de commande d'enregistrement se déplace dans la direction Ⓐ. Quand ces conditions sont obtenues, vérifier si le commutateur d'enregistrement est enclenché.
2. Appuyer sur la touche d'arrêt (STOP). Le levier de commande d'enregistrement se déplace dans la direction Ⓑ. Quand ces conditions sont obtenues, replier et ajuster le levier de commande d'enregistrement pour que la distance nécessaire à la mise en contact du commutateur d'enregistrement soit comprise entre 0,2 et 0,5mm.

REMARQUE:
La vitesse de défilement de la bande augmente lorsque la résistance variable est tournée dans le sens des aiguilles d'une montre et diminue lorsque la résistance est tournée dans le contraire des aiguilles d'une montre.

Réglage de la vitesse de défilement de la bande

1. Raccorder un fréquencemètre à la prise "DOL. L" de l'ensemble platine.
2. Lire le passage préenregistré de 3kHz de la bande d'étalonnage STD-301. Dès le début, la fréquence indiquée doit se trouver entre 3000 et 3010Hz, celle-ci pouvant être ajustée en tournant la résistance ajustable qui se trouve dans le trou de réglage du moteur d'entraînement du cabestan, comme représenté sur la figure 11-2.

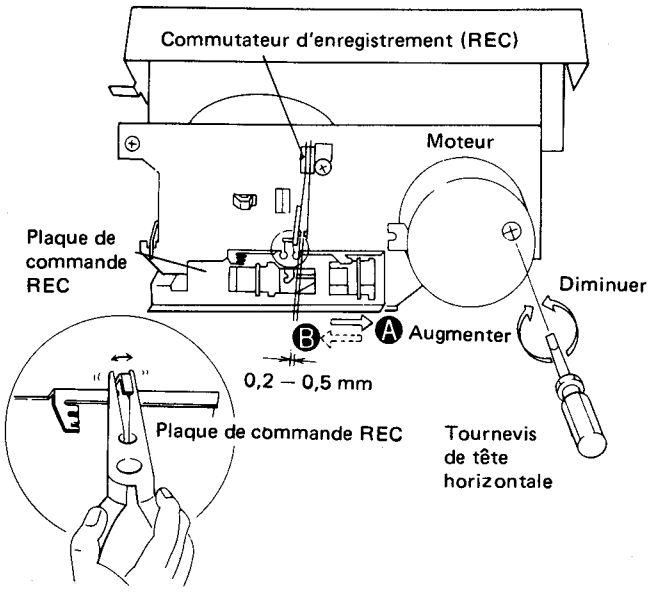


Fig. 11-2 Réglage de la vitesse de defilement de la bande et du commutateur d'enregistrement (REC)

Contrôle et réglage d'amortissement de la trappe à cassettes

1. Appuyer sur la touche d'éjection (EJECT) sans charger de cassette dans la trappe à cassettes et vérifier si la trappe s'ouvre normalement, progressivement et sans àcoups ni rebonds après son ouverture totale.
2. Si ces conditions ne sont pas satisfaites, effectuer un réglage à l'aide de la vis incorporée à la tête du cylindre.

Contrôle et réglage du raccord d'enregistrement

1. Vérifier si l'écartement F entre le raccord d'enregistrement et le commutateur à curseur se trouve entre 0 et 0,3mm lorsque le mécanisme d'entraînement est immobile et contrôler si le commutateur à curseur ne bouge pas.
2. Déplacer la position d'accrochage du mécanisme d'enregistrement vers l'arrière si l'écartement F est supérieur à 1mm et la déplacer vers l'avant quand il n'a aucun écart et que le commutateur à curseur bouge.
3. Si l'écartement F décrit plus haut ne peut pas être obtenu en procédant à ce réglage, replier la section du crochet de raccord d'enregistrement avec un paire de pinces sur la longueur appropriée.
4. Vérifier si le commutateur à curseur est parfaitement enclenché lorsque le mécanisme d'entraînement est placé en position d'enregistrement.
5. Vérifier également si le commutateur du ressort du mécanisme d'entraînement est court-circuité.

Tourner la vis dans le sens contraire des aiguilles d'une montre si la trappe s'ouvre par à-coups en deux étapes.

Tourner la vis dans le sens des aiguilles d'une montre si la trappe rebondit après s'être ouverte complètement

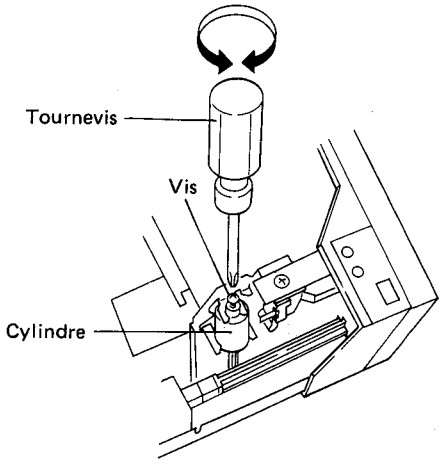


Fig. 11-3 Contrôle et réglage de l'amortissement de la trappe

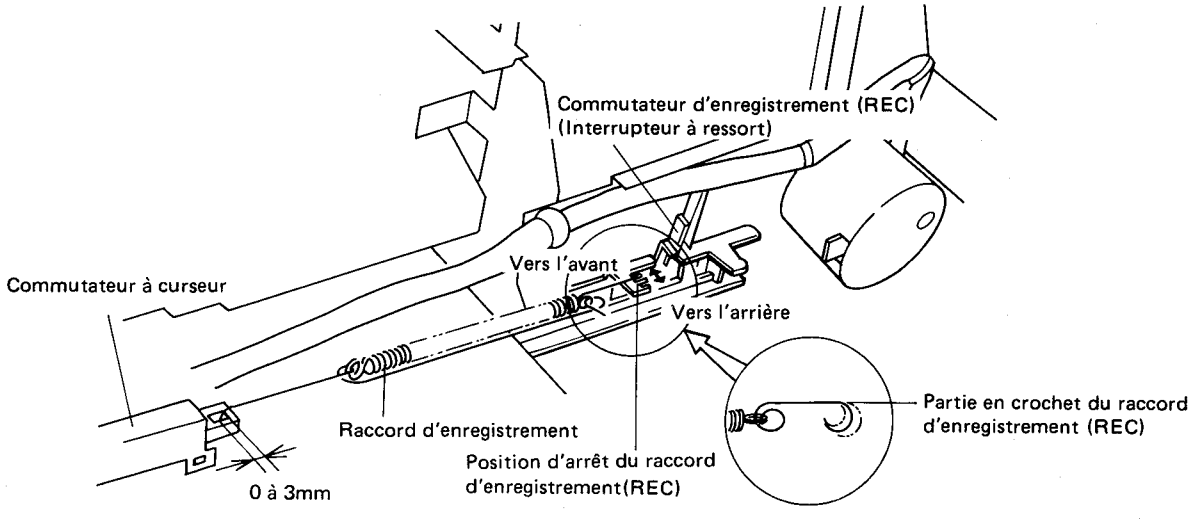


Fig. 11-4 Contrôle et réglage du raccord d'enregistrement

11.2 RÉGLAGES ÉLECTRIQUES

Conditions nécessaires pour effectuer les réglages

1. Les réglages des mécanismes doivent avoir été faits avant.
2. La tête magnétique doit être propre et démagnétisée.
3. La platine-cassette doit avoir fonctionnée pendant quelques minutes avant de commencer les réglages électriques.
4. Le signal de référence est de 0dB=1V effi.
5. A moins d'une indication contraire, les commutateurs mentionnés ci-dessous doivent se trouver dans la position indiquée.
   Sélecteur de source : sur TAPE
   DOLBY NR : Sur OFF
   TAPE SELECTOR : Sur NORM

Bandes de mesure

STD-331B : Réglages de lecture (Fig. 11-5)
STD-608A : Bande vierge ordinaire (NORMAL)
STD-603 : Bande vierge au chrome (CrO_2)
STD-610 : Bande vierge au fer (METAL)

Liste des réglages à exécuter

1. Réglage d'azimut de tête magnétique
2. Contrôle de l'égaliseur de lecture
3. Réglage de niveau de lecture
4. Calage de réponse en fréquence d'enregistrement et de lecture
5. Réglage du niveau d'enregistrement
6. Contrôle d'effet limiteur.

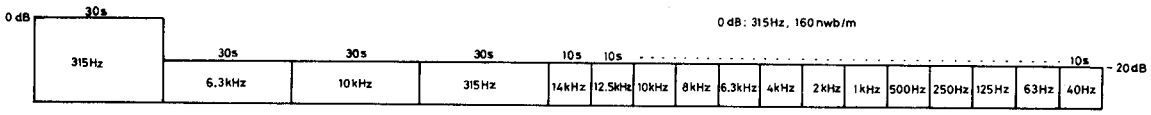


Fig. 11-5 Signaux préenregistrés sur la bande d'étalonnage STD-331B

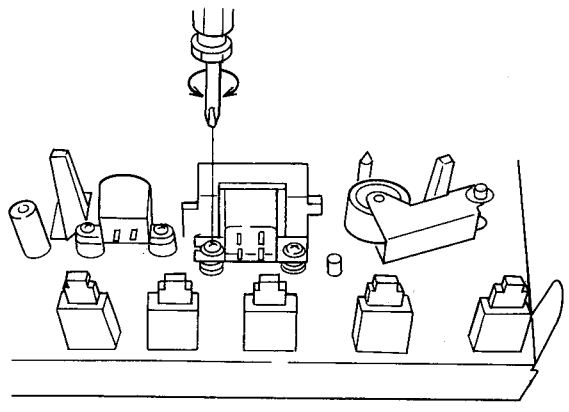


Fig. 11-6 Réglage d'azimut de tête magnétique

Bande d'étalonnage	STD-331B
Sélecteur de bande	NORM
Commutateur DOLBY NR	OFF

● Suite à l'effet de bordure, le canal droit doit être compensé de −1dB à 40Hz et 63Hz.

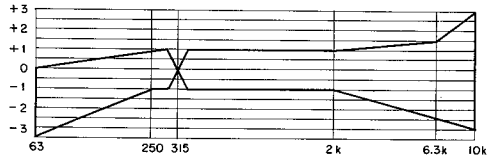


Fig. 11-7 Réponse en fréquence admissible en lecture

- Le commutateur DOLBY NR doit être placé en position OFF.

1. Réglage d'azimut de la tête magnétique.
- Tourner V101 et V201 sur leur position maximum (dans le sens maximum des aiguilles d'une montre).

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 10kHz/–20dB de la bande d'étalonnage STD-331B.	Vis de réglage d'azimut de tête. (Consulter la figure 11-6)	DOL, L (canal gauche) DOL, R (canal droit)	Niveau maximal du signal de lecture.	
3	ARRÊT	Bloquer la vis de réglage à la peinture lorsque le réglage est terminé.				

2. Contrôle de l'égaliseur de lecture.

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire les passages préenregistrés de 315kHz/–20dB et de 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	Le niveau de lecture de 6,3kHz est de –0,5±2dB par rapport au niveau de 315Hz.	
3	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2" ou "METAL".				
4	LECTURE	Lire les passages préenregistrés de 315kHz/–20dB et de 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	Le niveau de lecture de 6,3kHz est de –4,5±2dB par rapport au niveau de 315Hz.	

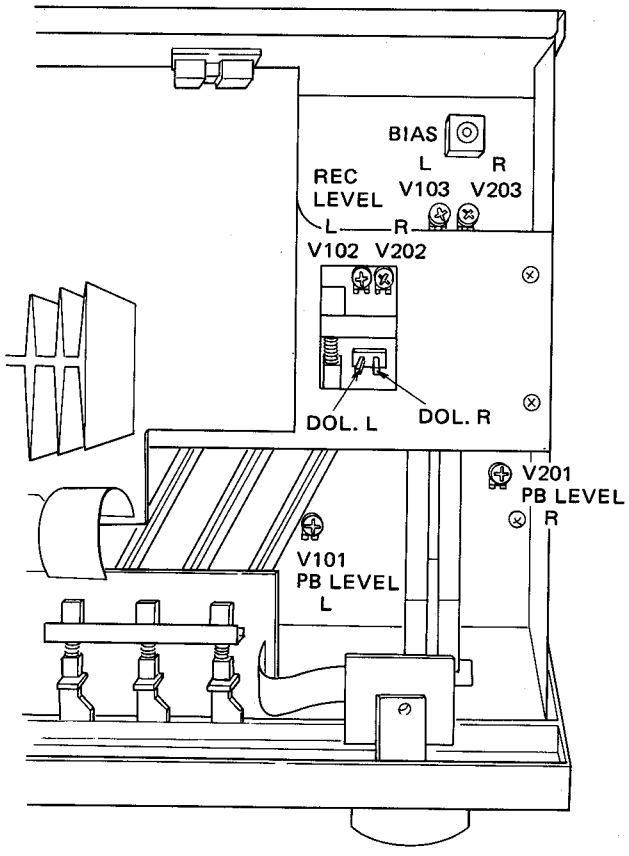


Fig. 11-8 Emplacement des composants de réglage

3. Réglage du niveau de lecture
• Ce réglage servant à étalonner le niveau DOLBY NR doit être exécuté avec un grand soin.

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 315kHz/0dB de la bande d'étalonnage STD-331B.	V101 (canal gauche) V201 (canal droit)	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv (412,1mV)	

4. Calage de réponse en fréquence d'enregistrement et de lecture.

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM". Placer le sélecteur de source (FUNCTION) en position "TUNER".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz/−30dBv (31,6mV) par les bornes d'entrée de syntoniseur "TUNER INPUT".	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	Environ −27,2dBv (41,2mV)	
3	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-608A à 315Hz et 6,3 kHz et lire ce passage.	V103 (canal gauche) V203 (canal droit)	DOL, L (canal gauche) DOL, R (canal droit)	Ajuster le niveau de lecture du signal 6,3kHz à $0^{+1}_{-0,5}$ dB ou au-dessus du niveau de 315Hz.	
4		Enregistrer et lire la signal jusqu'à 12kHz sur la bande d'étalonnage STD-608A et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-9 est satisfaite.				
5		Régler le commutateur DOLBY NR en position ON. Enregistrer et lire les signaux jusqu'à 10kHz sur la bande d'étalonnage STD-608A et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-9 est satisfaite.				
6		Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2". Enregistrer et lire les signaux jusqu'à 12kHz sur la bande d'étalonnage STD-603 et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-10 est satisfaite (lorsque le commutateur DOLBY NR est en position ON et position OFF.)				
7		Placer le sélecteur de bande (TAPE SELECTOR) en position "METAL". Enregistrer et lire les signaux jusqu'à 12kHz sur la bande d'étalonnage STD-610 et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-11 est satisfaite (lorsque le commutateur DOLBY NR est en position ON et position OFF.)				

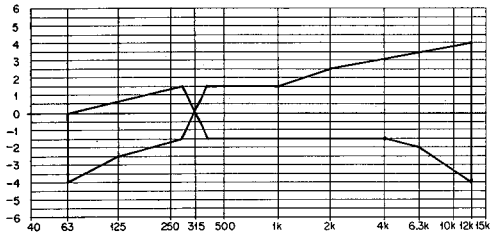
5. Réglage du niveau d'enregistrement.

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM". Placer le sélecteur de source (FUNCTION) en position "TUNER".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz par les bornes d'entrée de syntoniseur "TUNER INPUT".	Faire varier le niveau du signal injecté.	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv (412,1mV)	Le niveau du signal injecté est approximativement de −10dBv.
3		Régler le commutateur DOLBY NR en position ON.				
4	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-608A et lire ce passage.	V102 (canal droit) V202 (canal droit)	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv (412,1mV)	
5		Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2".				
6		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-603 et lire ce passage.	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv±1,5dB	
7		Placer le sélecteur de bande (TAPE SELECTOR) en position "METAL".				
8		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étallonage STD-610 et lire ce passage.	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv±1,5dB	

6. Contrôle de l'effet limiteur.

	Mode	Signal injecté et bande d'étalonnage	Emplacement du composant de réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM". Placer le sélecteur de source (FUNCTION) en position "TUNER".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 1kHz par les bornes d'entrée de syntoniseur "TUNER INPUT"	Faire varier le niveau du signal injecté.	DOL, L (canal gauche) DOL, R (canal droit)	−7,7dBv (412,1mV)	Le niveau du signal injecté est approximativement de −10dBv.
3		Accroitre le niveau du signal injecté de plus de +10dB de plus que le réglage effectué au cours de l'opération 2.	Contrôler	DOL, L (canal gauche) DOL, R (canal droit)	−2,3dBv±1,5dB	Le niveau du signal injecté est approximativement de 0dBv.

Bande d'étalonnage	STD-608A
Sélecteur de bande	NORM
Commutateur DOLBY NR	OFF



Bande d'étalonnage	STD-608A
Sélecteur de bande	NORM
Commutateur DOLBY NR	ON

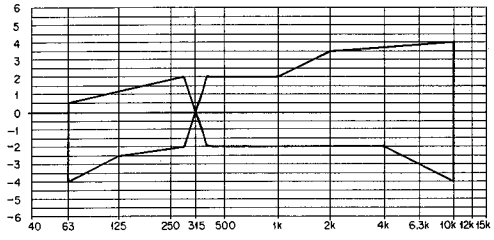
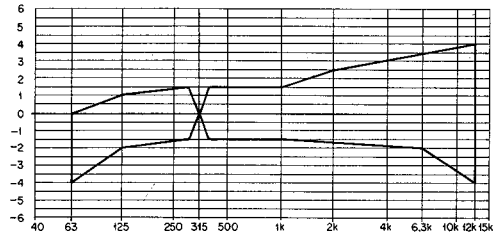


Fig. 11-9 Zone de réponse en fréquence admissible de lecture et d'enregistrement (NORM)

Bande d'étalonnage	STD-603
Sélecteur de bande	CrO_2
Commutateur DOLBY NR	OFF



Bande d'étalonnage	STD-603
Sélecteur de bande	CrO_2
Commutateur DOLBY NR	ON

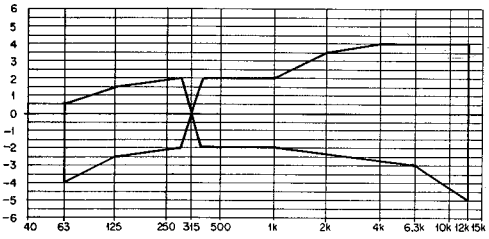
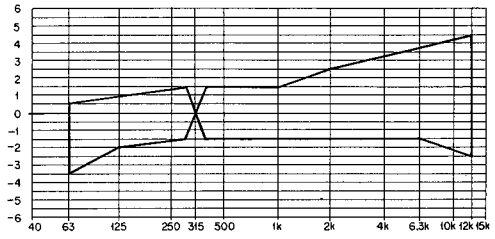


Fig. 11-10 Zone de réponse en fréquence admissible de lecture et d'enregistrement (CrO_2)

Bande d'étalonnage	STD-610
Sélecteur de bande	METAL
Commutateur DOLBY NR	OFF



Bande d'étalonnage	STD-610
Sélecteur de bande	METAL
Commutateur DOLBY NR	ON

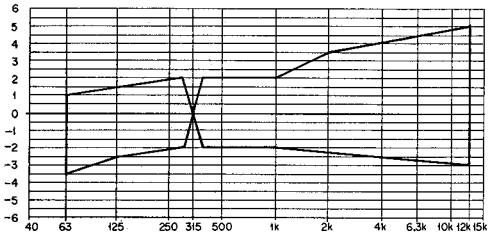


Fig. 11-11 Zone de réponse en fréquence admissible de lecture et d'enregistrement (METAL)

11. AJUSTES

11.1 AJUSTES MECANICOS

Antes del ajuste

Limpiar ambas bases de los carretes, el eje de arrastre y el rodillo de presión con algodón remojado en alcohol.

Ajuste de la presión del rodillo de presión

1. Establecer el magnetófono en el modo de reproducción.
2. Con el calibrador de tensión, presionar ligeramente contra el brazo del rodillo de presión y separar un poco dicho rodillo del eje de arrastre.
3. Luego reponer el rodillo de presión sobre el eje de arrastre, y leer el valor en el momento que el rodillo de presión empieza a girar. Si la indicación no está dentro de 300—500g, reemplazar el muelle del rodillo de presión.

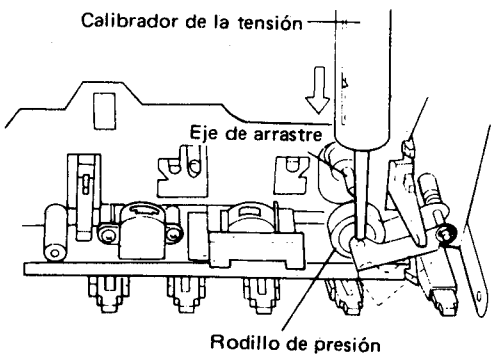


Fig. 11-1 Ajuste de la presión del rodillo de presión

Ajuste de la torsión de la base del carrete

Utilizar el medidor de torsión para medir la torsión durante las funciones de reproducción, avance rápido (FF) y rebobinado (REW). Los valores obtenidos deben estar normalmente dentro de los límites permisibles enumerados en la tabla 1.

Si los valores obtenidos no están dentro de tales límites, reemplazar el conjunto de la base del carrete tensor (TU) y/o el conjunto de la base del carrete de suministro, la rueda de guía TU, o todo el conjunto del brazo de arrastre.

Tabla 1

	Base del carrete TU	Base del carrete de suministro
Modo de reproducción	38 – 57g.cm	*1,5 – 5g.cm
Modo de avance rápido	75 – 135g.cm	*1,5 – 5g.cm
Modo de rebobinado	1,5 – 5g.cm	75 – 135g.cm

* *Indica par de torsión de contratensión.*

Ajuste del interruptor de grabación (REC)

1. Presionar el botón REC. La palanca de accionamiento de REC se mueve en la dirección Ⓐ. En este momento, comprobar que el interrutor REC está en la posición ON.
2. Presionar el botón de parada (STOP). La palanca de accionamiento de REC se mueve ligeramente en la dirección Ⓑ. Entonces, doblar y ajustar la palanca de accionamiento de REC de modo que la distancia de contacto del interruptor REC sea de 0,2~0,5mm.

NOTA:
La velocidad de la cinta aumentará al girar a la derecha el resistor semifijo, y se reducirá al giarlo a la izquierda.

Ajuste de la velocidad de la cinta

1. Conectar el frecuentímetro al terminal DOL. L del conjunto del magnetófono.
2. Reproducir la parte de 3kHz de la cinta de prueba STD-301. Al principio, la frecuencia deberá estar entre 3000Hz~3010Hz, y podrá ajustarse girando el resistor semifijo ubicado en el orificio de ajuste del motor, como se muestra en la Fig. 11-2.

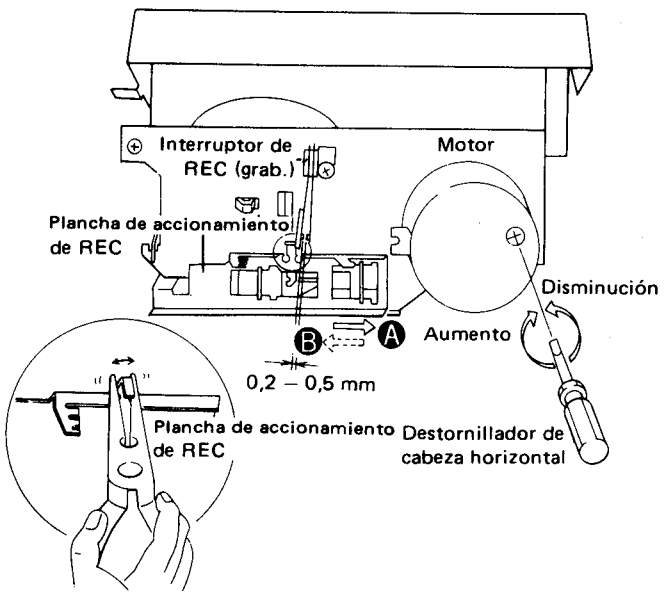


Fig. 11-2 Ajuste de la velocidad de la cinta y del interruptor de grabación (REC)

Comprobación y ajuste del amortiguamiento de la puerta

1. Presionar el botón de expulsión (EJECT) sin haber ningún casete insertado en el compartimiento del casete, y comprobar que la puerta se abre suavemente sin movimientos interrumpidos ni rebote después de haberse abierto por completo.
2. Si no se satisfacen estas condiciones, ajustar girando el tornillo de ajuste del cabezal del cilindro.

Girar el tornillo hacia la izquierda si la puerta se abre con interrupciones en dos etapas.

Girar el tornillo hacia la derecha si la puerta rebota después de haberse abierto por completo.

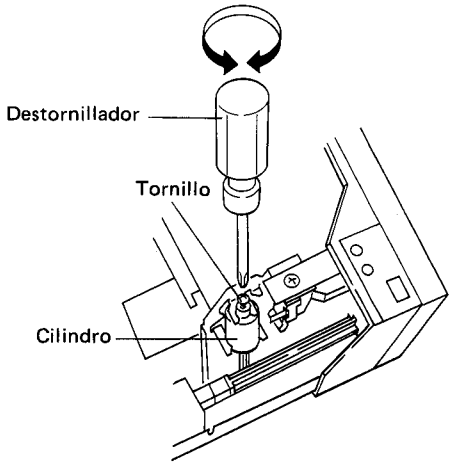


Fig. 11-3 Comprobacion y ajuste del amortiguamiento de la puerta

Comprobación y ajuste de la unión de grabación REC

1. Comprobar que el entrehierro F entre la unión REC y el conmutador deslizante es de 0 a 0,3 mm cuando el mecanismo de transporte está detenido (y comprobar que no se mueve el conmutador deslizante).
2. Mover la posición de engrane del mecanismo de unión REC hacia atrás si el entrehierro F es mayor a 1mm, y moverla hacia adelante si no hay entrehierro y se mueve el conmutador deslizante.
3. Si el entrehierro F descrito no puede obtenerse mediante el ajuste mencionado, doblar la sección de gancho de la unión REC con un alicates.
4. Comprobar que el conmutador deslizante está completamente conmutado cuando el mecanismo de transporte está en el modo de grabación.
5. Comprobar tambień que el interruptor de muelle del mecanismo está cortocircuitado.

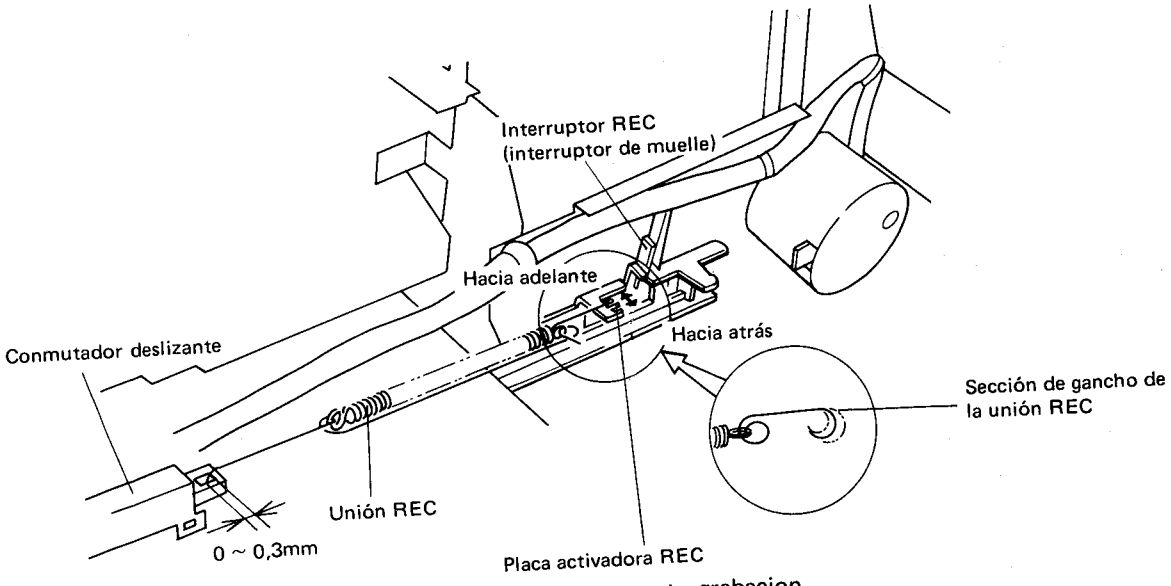


Fig. 11-4 Comprobacion y ajuste de la union de grabacion

11.2 AJUSTES ELECTRICOS

Condiciones de ajuste

1. Los ajustes mecánicos deben terminarse primero.
2. Limpiar y desimanar la cabeza de grabación.
3. Dejar que el magnetófono se precaliente por unos minutos antes de iniciar los ajustes eléctricos.
4. La señal de referencia es de 0dB=1Vrms.
5. A menos que se especifique de otra manera, los siguientes interruptores deben estar en las posiciones indicadas:

   FUNCION : TAPE
   DOLBY NR : OFF
   SELECTOR DE CINTA : NORM

Cintas de prueba

STD-331B : Para ajustes de reproducción (Referirse a la Fig. 11-5)
STD-608A : Cinta NORMAL en blanco.
STD-603 : Cinta CrO_2 en blanco.
STD-610 : Cinta de METAL en blanco.

Lista de ajustes y comprobaciones

1 Ajuste azimutal de la cabeza de grabación
2. Comprobación del ecualizador de reproducción
3. Ajuste del nivel de reproducción
4. Ajuste de la respucsta de frecuencia de grabación y reproducción
5. Ajuste del nivel de grabación
6. Comprobación del efecto del limitador.

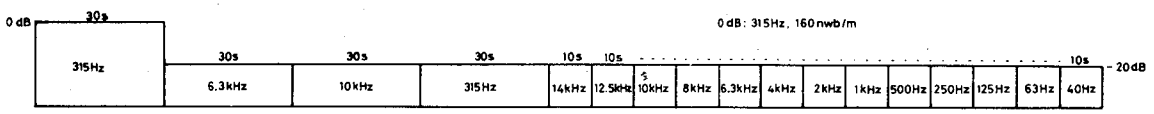


Fig. 11-5 Contenido de la cinta de prueba STD-331B

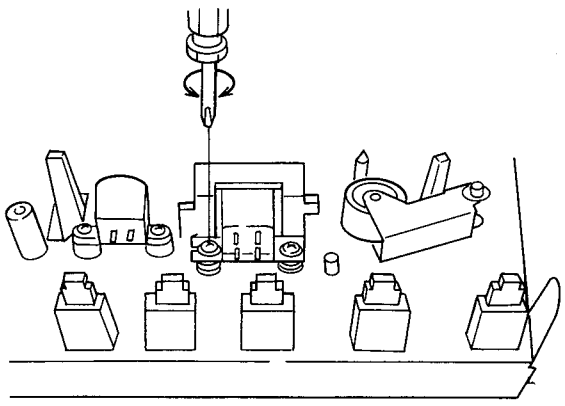


Fig. 11-6 Ajuste azimutal de la cabeza de grabación

Cinta de prueba	STD-331B
Selector de cinta	NORM
Interruptor DOLBY NR	OFF

• La señal del canal derecho se compensa en −1dB desde los valores reales de 40Hz y 63Hz.

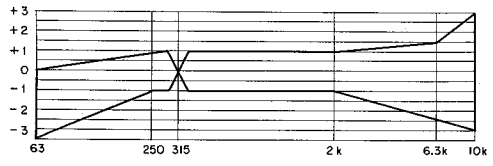


Fig. 11-7 Zona de respuesta de frecuencia de reproducción permisible

- Regular el interruptor DOLBY NR a la posición OFF.

1. Ajuste del acimut de la cabeza.
- Girar V101 y V201 a la posición máxima (completamente a la derecha).

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir la parte de 10kHz/–20dB de la cinta de prueba STD-331B.	Tornillo de ajuste del acimut de la cabeza. (Ver la Fig. 11-6)	DOL. L (Canal izq.) DOL. R (Canal der.)	Nivel máximo de la señal de reproducción.	
3	Parada (STOP)	Trabar el tornillo con "Screw lock" después del ajuste.				

2. Comprobación del ecualizador de reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir las partes de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Comprobar	DOL. L (Canal izq.) DOL. R (Canal der.)	El nivel de reproducción de 6,3kHz debe ser de –0,5±2dB con respecto al nivel de 315Hz.	
3	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2 o METAL.				
4	Reproducción (PLAY)	Reproducir las partes de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Comprobar	DOL. L. (Canal izq.) DOL. R (Canal der.)	El nivel de reproducción de 6,3kHz debe ser de –4,5±2dB con respecto al nivel de 315Hz.	

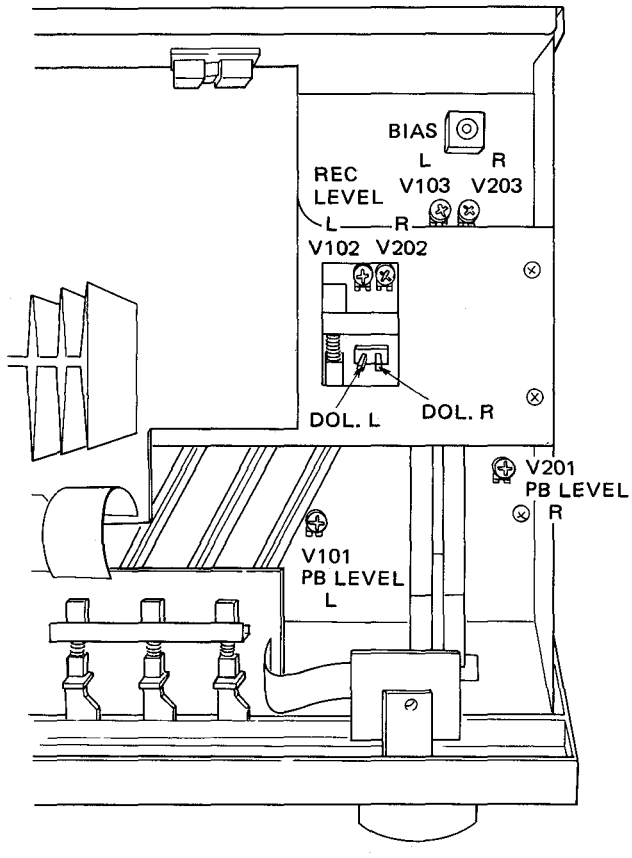


Fig. 11-8 Puntos de ajuste

3. Ajuste del nivel de reproducción
• Este ajuste determina el nivel DOLBY NR, y debe efectuarse con gran cuidado.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir la parte de 315Hz/0dB de la cinta de prueba STD-331B.	V101 (Canal izquierdo) V201 (Canal derecho)	DOL. L (Canal izq.) DOL. R (Canal der.)	−7,7dBv (412.1mV)	

4. Ajuste de la respuesta de frecuencia de grabación y reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM. Regular el interruptor de función (FUNTION) a la posición TUNER.				
2	Pausa en grabación (REC-PAUSE)	Aplicar una señal de 315Hz/−30dBv (31,6mV) a los terminales TUNER INPUT.	Comprobar	DOL. L (Canal izq.) DOL. R (Canal der.)	Aprox. −27,7dBv (41,2mV)	
3	Grabación/ reproducción (REC/ PLAY)	Grabar la señal en la cinta de prueba STD-608A a 315Hz y 6,3kHz, y reproducir luego esta parte de la cinta.	V103 (Canal izquierdo) V203 (Canal derecho)	DOL. L (Canal izq.) DOL. R (Canal der.)	Ajustar el nivel de reproducción de 6,3kHz a $0^{+1}_{-0,5}$dB mayor al nivel de 315Hz.	
4		Grabar y reproducir las señales de hasta 12kHz en la cinta de prueba STD-608A, y comprobar que las señales están de acuerdo con la zona de respuesta de frecuencia permisible mostrada en la Fig. 11-9.				
5		Regular el interruptor DOLBY NR a la posición ON. Grabar y reproducir las señales de hasta 10kHz en la cinta de prueba STD-608A, y comprobar que estas señales están de acuerdo con la zona de respuesta de frecuencia permisible mostrada en la Fig. 11-9.				
6		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2. Grabar y reproducir las señales de hasta 12kHz en la cinta de prueba STD-603, y comprobar que estas señales están de acuerdo con la zona de respuesta de frecuencia permisible mostrada en la Fig. 11-10 (para ON y OFF de DOLBY NR).				
7		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición METAL. Grabe y reproduzca las señales de hasta 12kHz en la cinta de prueba STD-610, y comprobar que estas señales están de acuerdo con la zona de respuesta de frecuencia permisible mostrada en la Fig. 11-11 (para ON y OFF de DOLBY NR).				

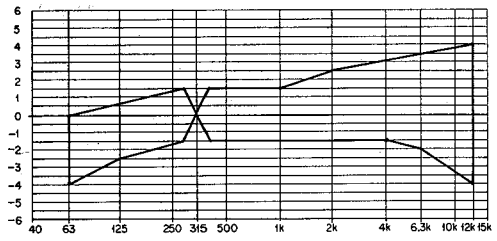
5. Ajuste del nivel de grabación.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Volor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM. Regular el interruptor de función (FUNCTION) a la posición TUNER.				
2	Pausa en grabación (REC-PAUSE)	Aplicar una señal de 315Hz a los terminales TUNER INPUT.	Cambiar el nivel de señal de entrada.	DOL. L (Canal izq.) DOL. R (Canal der.)	−7,7dBv (412mV)	El nivel de señal de entrada es de aprox. −10dBv.
3		Regular el interruptor DOLBY NR a la posición ON.				
4	Grabación/ reproducción (REC/ PLAY)	Grabar las señales en la cinta de prueba STD-608A, y reproducir luego esta parte de la cinta.	V102 (Canal izquierdo) V202 (Canalderecho)	DOL. L (Canal izq.) DOL. R (Canal der.)	−7,7dBv (412,1mV)	
5		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2.				
6		Grabar las señales en la cinta de prueba STD-603, y reproducir luego esta parte de la cinta.	Comprobar	DOL. L (Canal izq.) DOL. R (canal izq.)	−7,7dBv±1,5dB	
7		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición METAL.				
8		Grabar las señales en la cinta de prueba STD-610, y reproducir luego esta parte de la cinta.	Comprobar	DOL. L (Canal izq.) DOL. R (Canal der.)	−7,7dBv±1,5dB	

6. Comprobación del efecto del limitador.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM. Regualr el interruptor de función (FUNCTION) a la posición TUNER.				
2	Pausa en grabación (REC-PAUSE)	Aplicar una señal de 1kHz a los terminales TUNER INPUT.	Cambiar el nivel de señal de entrada.	DOL. L (Canal izq.) DOL. R (Canal der.)	−7,7dBv (412,1mV)	El nivel de señal de entrada es de aprox. −10dBv.
3		Aumentar el nivel de señal de entrada a +10dB mayor al nivel indicado en el procedimiento 2.	Comprobar	DOL. L (Canal izq.) DOL. R (Canal der.)	−2,3dBv±1,5dB	El nivel de señal de entrada es de aprox. 0dBv.

Cinta de prueba	STD-608A
Selector de cinta	NORM
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-608A
Selector de cinta	NORM
Interruptor DOLBY NR	ON

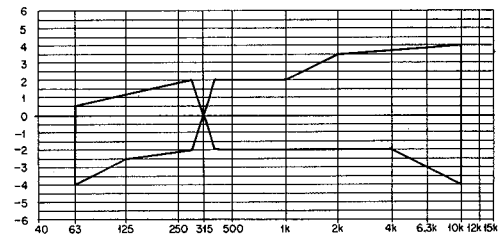
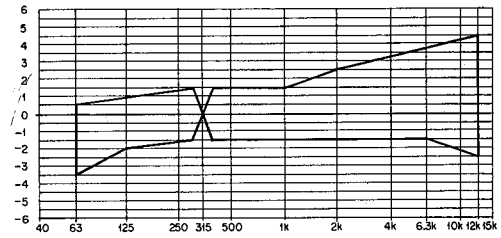


Fig. 11-9 Zona de respuesta de frecuencia de grabación y reproducción permisible (NORM)

Cinta de prueba	STD-610
Selector de cinta	METAL
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-610
Selector de cinta	METAL
Interruptor DOLBY NR	ON

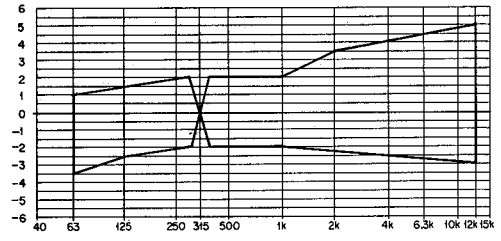
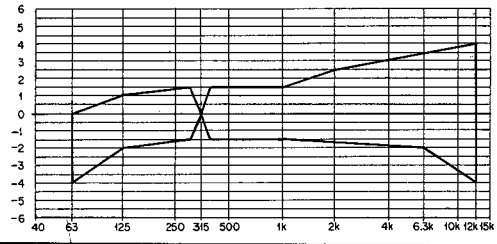


Fig. 11-11 Zona de respuesta de frecuencia de grabación y reproducción permisible (METAL)

Cinta de prueba	STD-603
Selector de cinta	CrO_2
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-603
Selector de cinta	CrO_2
Interruptor DOLBY NR	ON

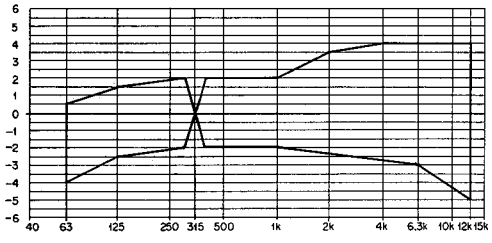
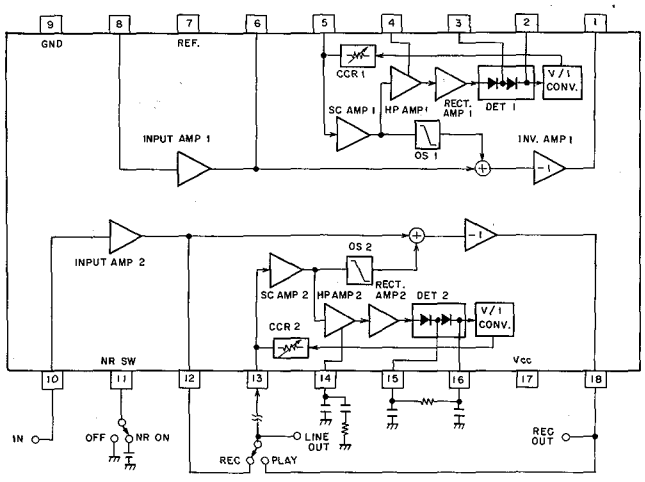


Fig. 11-10 Zona de respuesta de frecuencia de grabación y reproducción permisible (CrO_2)

15. IC DATA (HA12045)

Block Diagram



Pin Description

Pin No.	I/O	Name	Description
1	Output	REC OUT 1	Inv. amp. output.
2	–	DET1-2	Detector filter.
3	–	DET1-1	Detector filter.
4	–	HPF 1	Filter network (1).
5	Input	VCR1	Side chain amp. input (1).
6	Output	MONI. OUT	Input amp. output (1).
7	Output	REF	Reference voltage output.
8	Input	INPUT 1	Audio input (1).
9	–	GND	Ground.
10	Input	INPUT 2	Audio input (2).
11	Input	NR SW	Noise reduction switch (High active).
12	Output	MONI. OUT	Input amp. output (2).
13	Input	VCR2	Side chain amp. input (2).
14	–	HPF2	Filter network (2).
15	–	DET2-1	Detector filter.
16	–	DET2-2	Detector filter.
17	–	Vcc	DC power.
18	Output	REC OUT2	Inv. amp. output.

13. MECHANISM DESCRIPTION

The mechanical portion of the DC-200Z (201Z) uses separate power assist mechanisms for the PLAY and REC system for light-touch operation. A mechanical auto-stop function is also built-in.

STOP Mode

Fig. 13-1 shows the PLAY and REC power assist mechanisms in the stop mode. In this status, the cam gear stopper A is making contact with gear lever A, so the cam gear and capstan gear (flywheel) are not meshed. (When the power switch is ON, the motor continues rotating, driving the capstan gear via the belt).

PLAY Operating (Fig. 13-2, 13-3)

1. When the PLAY button is pressed down, the shape of the button forces gear lever A in the ① direction. Also, at the same time, gear lever B travels in the ① direction, and gear lever A and cam gear stopper A are disengaged.
2. The cam gear is forced in the direction ② by the trigger spring. Consequently, it starts rotating in the direction ② (CCW) and meshes with the capstan gear (flywheel).
3. As the capstan gear and cam gear are now engaged, the force transmitted by the motor and flywheel rotate the cam gear further, until stopper C makes contact with gear lever B. It stops in that position. At this point, the capstan gear and cam gear are no longer meshed. (See right side of Fig. 13-2).
4. Now, the projection on the cam gear boss is forcing the brake-plate down in the direction ③ , and braking force is released from the reel base.
5. Also, the cam shape of the cam gear is moving the action lever in the ④ direction.
6. The head base is lifted by the action of this action lever, placing it in the PLAY position and throwing the PLAY switch to the PLAY side. (See Fig. 13-3). This action also presses down on the pinch roller pressure spring causing pressure contact between the pinch roller and capstan, and starting tape travel.
7. At the same time, the TU (take-up) idler is forced up into contact with the take-up reel base to start it rotating, and the PLAY mode is entered.

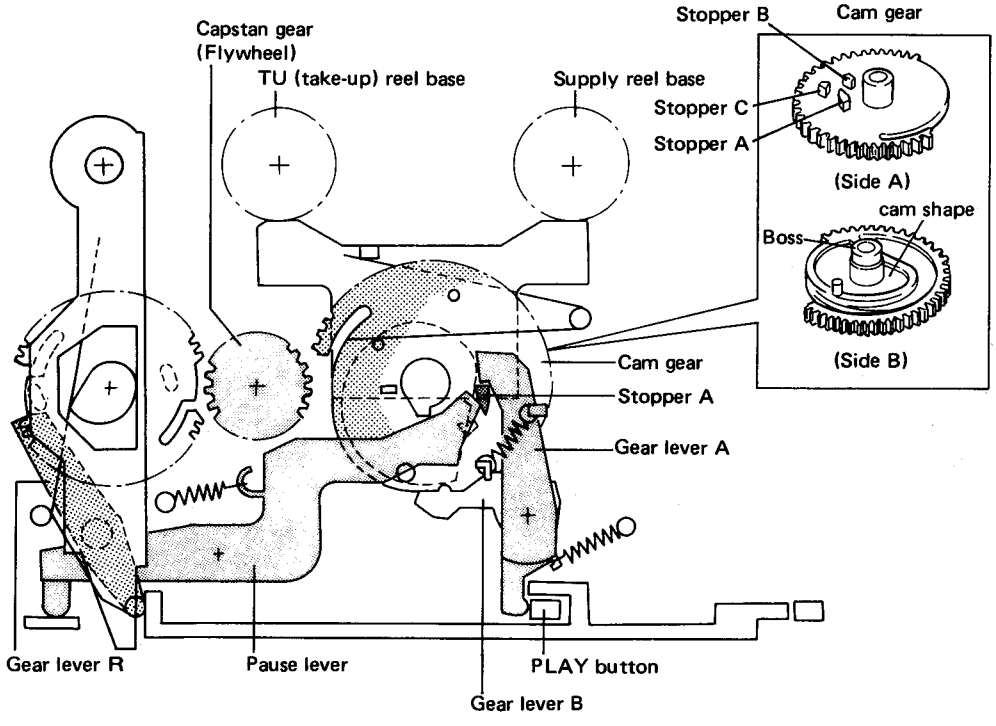


Fig. 13-1 Mechanism in STOP mode (Rear View)

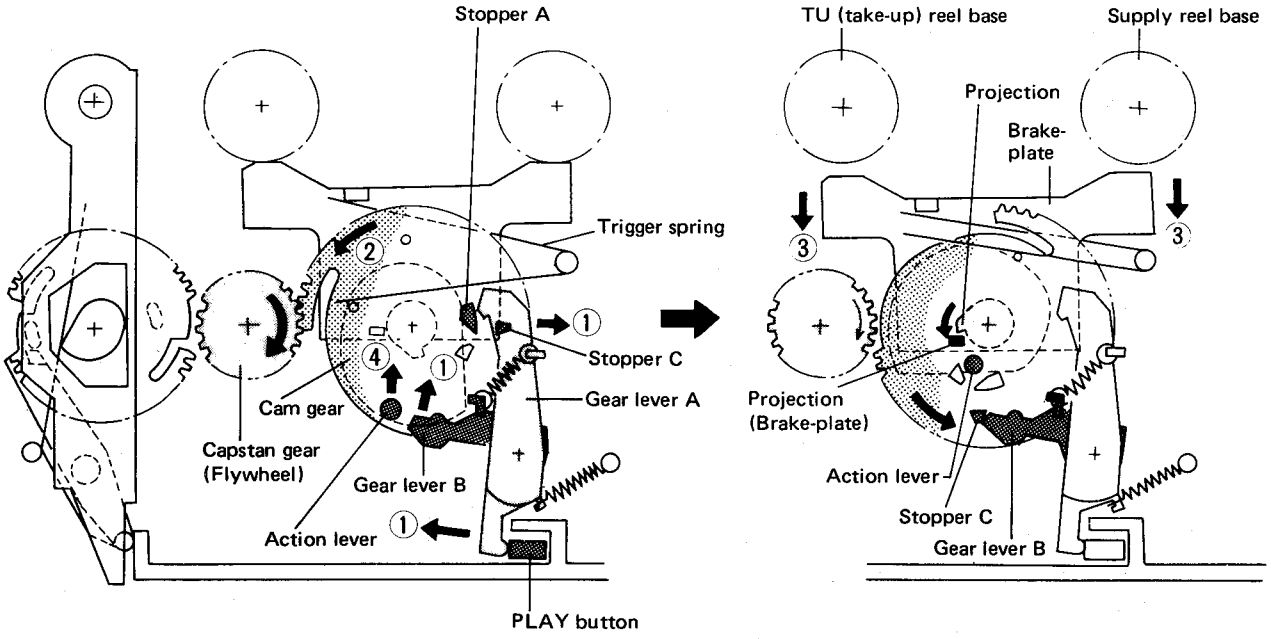


Fig. 13-2 STOP → PLAY operation

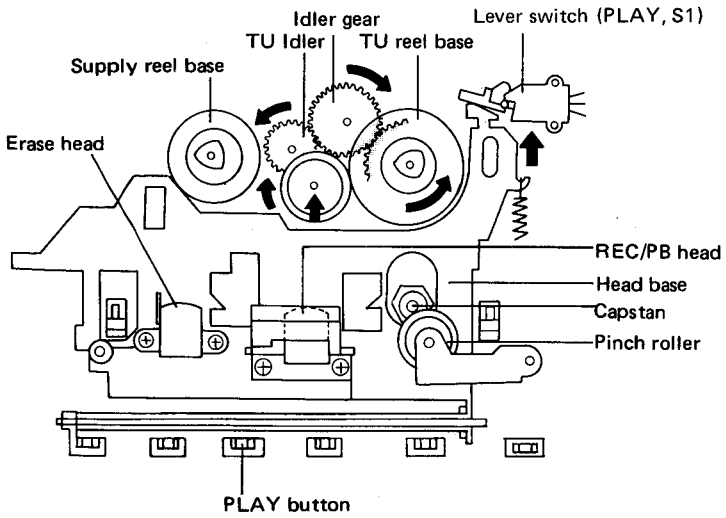


Fig. 13-3 PLAY operation

PLAY – STOP Operation (Fig. 13-4)

1. When the STOP button is pressed, the PLAY button lock is released, and the force of gear lever spring A returns gear lever A and B in the direction ⑤ . This action separates cam gear stopper C from gear lever B.
2. As cam gear stopper C moves away from gear lever B, the compression force of the trigger spring rotates the cam gear in the direction ② until stopped by contact between cam gear stopper A and gear lever A. (See the right side of Fig. 13-4).
3. This rotating action releases the brake-plate from the projection on the cam gear boss. The brake-plate is returned to its up position by the force of the trigger spring, stopping the rotation of the supply and take-up reel base.
4. At the same time, the shape of the cam (machined on the upper surface of the cam gear) returns the action lever in the ⑥ direction, releasing the pressure contact the pinch roller and TU idler are placing on the reel base. The head base also returns to the STOP position, and the PLAY switch is thrown to the STOP side, completing entry into the STOP mode.

PLAY – PAUSE Operation –PAUSE Release (Fig. 13-5)

1. When the PAUSE button is pressed (unit in PLAY mode), the cam on the PAUSE button moves the pause lever in the ⑦ direction.
2. The pause lever pushes gear lever B up in the ⑧ direction, releasing the cam gear stopper C. The cam gear starts rotating in the ⑨ direction, stopping at the point cam gear stopper A makes contact with the pause lever tip.
3. The rotation of the cam gear causes the brake plate, pinch roller, TU idler, head base, and PLAY switch to all return to the STOP position (See PLAY → STOP Operation), entering the PAUSE mode.

PAUSE Mode Release:

4. Once again pressing the PAUSE button releases the pause ratchet mechanism, and the pause button (presently in contact with the return spring) returns to its original position.
5. Since the pause lever is moved in the ⑩ direction by the pause lever return spring, stopper A on the cam gear is released from the pause lever.
6. The force of the trigger spring moves the cam gear in the ⑨ direction and starts meshing the cam gear with the capstan gear. From this point, all operations are the same as in the PLAY mode, and tape travel is re-started.

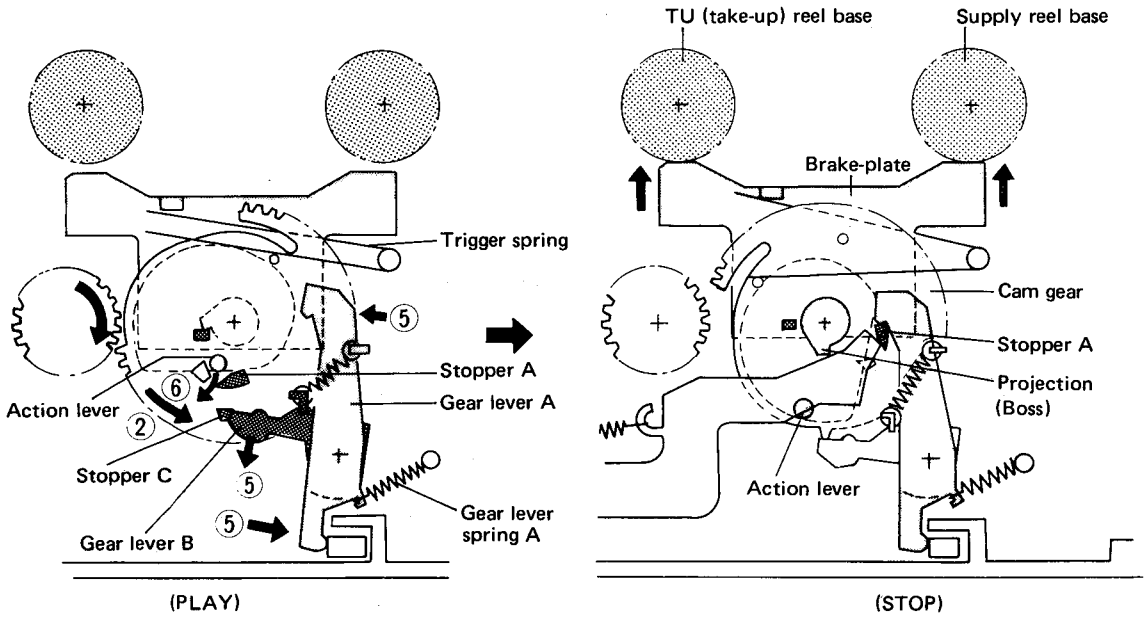


Fig. 13-4 PLAY → STOP operation

REC Operations (Fig. 13-6, 13-7)

1. When the REC button is pressed, the cam on the REC button moves the REC connection arm in the ① direction, gear lever R in the ② direction, and gear lever A in the ③ direction.
2. With the movement of gear lever R, stopper A on cam gear R is released from gear lever R, cam gear forced down by the pressure exerted by trigger spring R, and starts rotating in the ④ direction. It then commences to mesh with the capstan gear.
3. As cam gear R becomes meshed with the capstan gear, cam gear R continues rotating until stopper B (on cam gear R) makes contact with gear lever R, stopping it in that position.
4. At this time, the shape of the cam on cam gear R causes the REC action lever to move in the ⑤ direction, pressing on the REC action plate. (Fig. 13-7).
5. The function of the REC action plate is to throw the REC switch and REC/PLAY switch to the REC side.

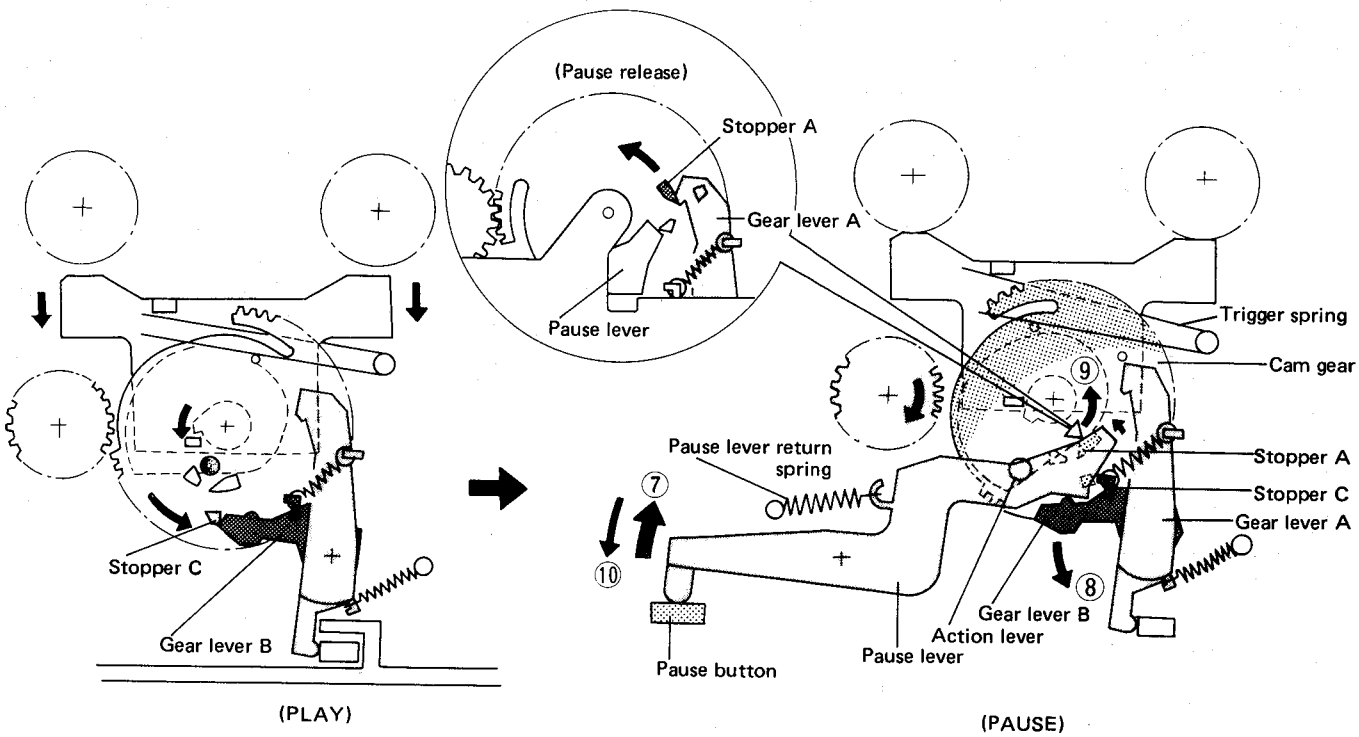


Fig. 13-5 PLAY → PAUSE operation

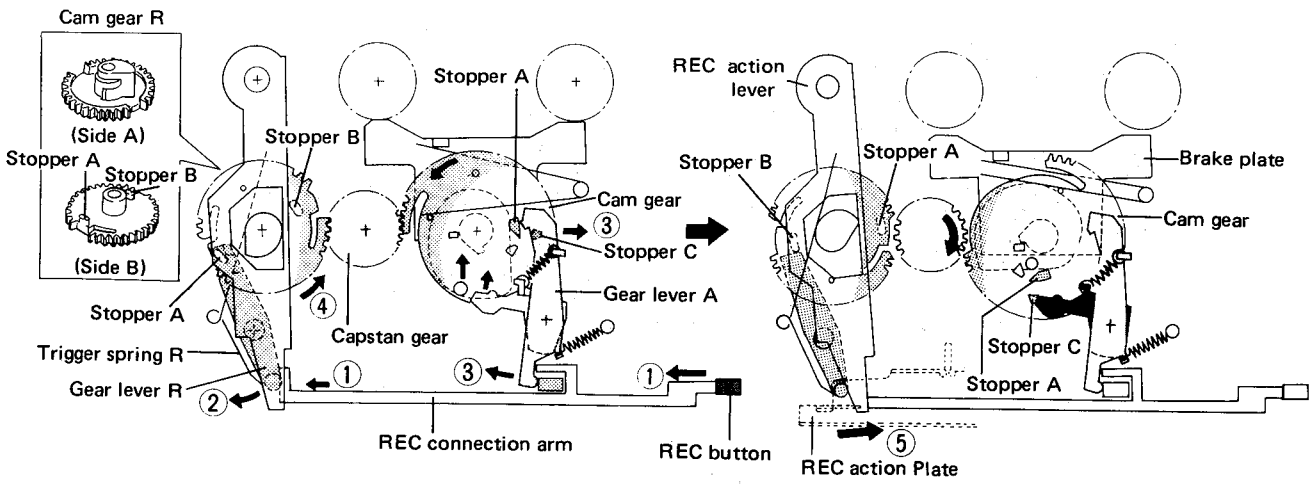


Fig. 13-6 STOP → REC operarion

6. Also, as gear lever A becomes released from stopper A on the cam gear (noted in step 1. above), the cam gear meshes with the capstan gear to start tape travel, and as the PLAY switch is also thrown to the PLAY side (see PLAY Operations), the REC mode is entered.

REC – PAUSE Operation – PAUSE Release

1. In going from REC to PAUSE, all operations are as outlined in PLAY → PAUSE Operation. In other words, when the REC switch and the REC/PLAY switch remain on the REC side, tape travel is stopped by only the PLAY switch being thrown to the STOP side.
2. PAUSE release also conforms to the operations outlined in PLAY → PAUSE Operation → PAUSE Release. Here, the PLAY switch is thrown to the PLAY side, and re-starting tape travel causes entry into the REC mode.

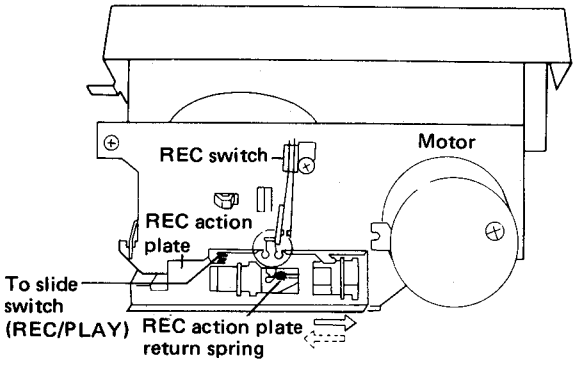


Fig. 13-7 STOP → REC operation (REC switch ON)

REC – STOP Mode (Fig. 13-8)

1. When the STOP button is pressed releasing the REC button lock, the trigger spring R returns the REC connection arm and gear lever R in the ⑥ direction, breaking contact with stopper B on cam gear R.
2. The REC action plate return spring rotates cam gear R in the ⑦ direction, and starts meshing it with the capstan gear.
3. Cam gear R continues to rotate until stopper A (on cam gear R) makes contact with gear lever R, stopping it in the former position of stopper B.
4. The shape of the cam on cam gear R returns the REC action lever and REC action plate to the STOP position, and throws the REC switch and REC/PLAY switch to the PLAY side.
5. Also, the action of gear lever A returning to the STOP position throws the PLAY switch to the STOP side, halting tape travel. (Refer to PLAY → STOP Operation).
   * In the REC → STOP cycle, cam gear R and the capstan gear are meshed to have the switch timing of the PLAY and REC/PLAY switches.

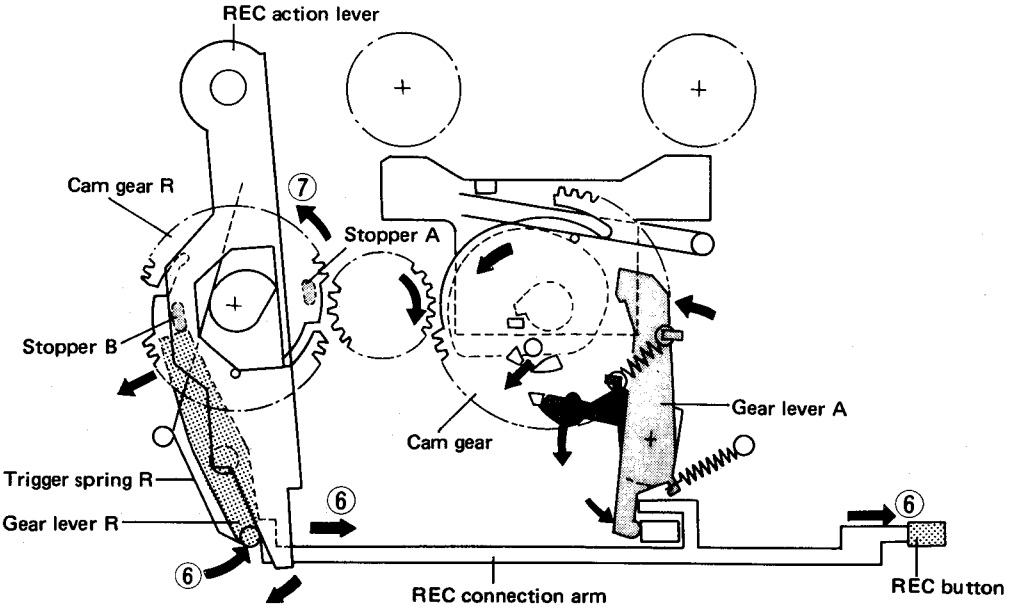


Fig. 13-8 REC → STOP operation

FF (or REW) Operations (Fig. 13-9 – 13-11)

1. When the FF (or REW) button is pressed, joint R (L) moves in the direction of ① , pressing down (① direction) on the FF (REW) action plate. At the same time, the lever switch is thrown to the ON position (Fig. 13-9, 13-10).
2. Next, the brake-plate is pressed down by the FF (REW) action plate, and at this time the driving arm is forced in the ③ (or ④) direction to start the reel base rotating in the FF (or REW) mode.
3. At the same time, gear lever C moves in the ⑤ direction and the head base (HB) lock lever moves in the ⑥ (or ⑦) direction. (This procedure also applies to MS operations).

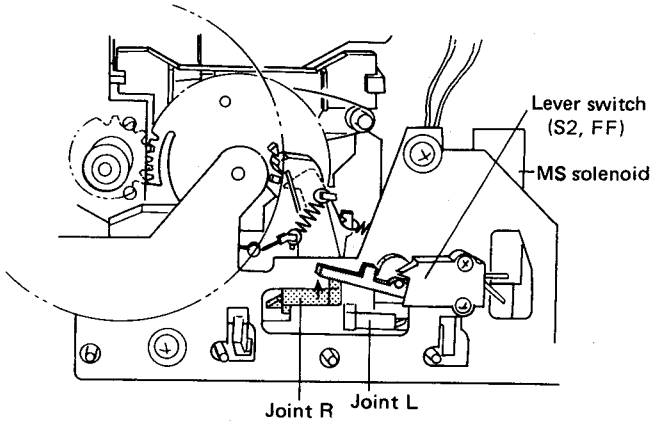


Fig. 13-9 FF (REW), MS operation 1
(Lever switch ON)

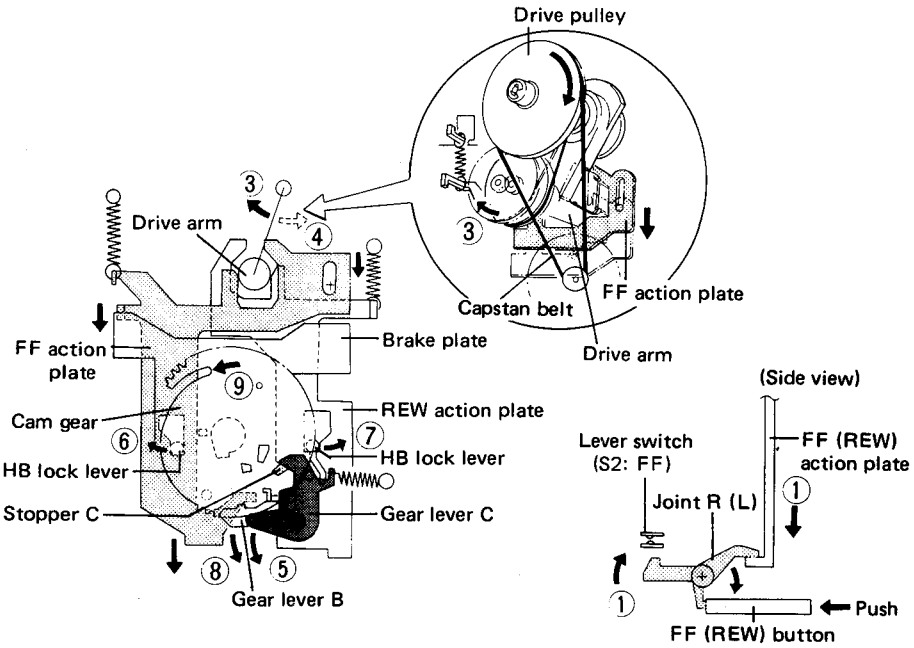


Fig. 13-10 FF (REW) operation, MS operation II

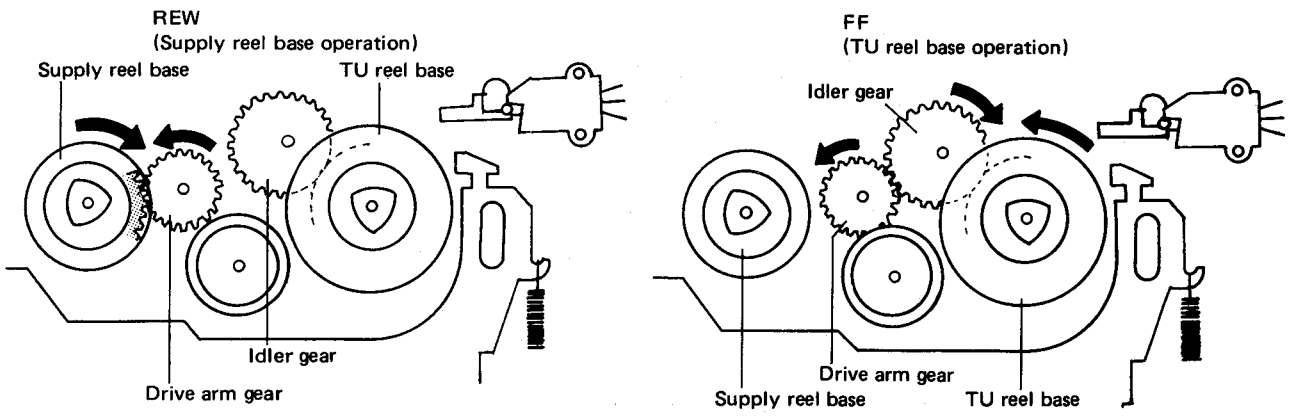


Fig. 13-11 FF, REW operation III

Auto-stop Operations (Fig. 13-12)

1. In each of the previously covered operation cycles, when the brake-plate is moved in the direction of ⑪ , the detector lever is pulled in the ⑫ direction by the force of the link return spring. As the cam gear rotates, pin (A) on the detector lever makes contact with cam (A) or cam (B) on the cam gear.
2. The cam gear normally turns with motor rotation, and with each revolution of the cam gear, the detector lever is moved to a center position relative to cam (A) (PLAY, REC, FF) or cam (B) (REW).
3. After the detector lever has been moved to the center position, if the reel base is still rotating, the friction torque of the detector disc again moves it to the right (in REW) or left (in PLAY, REC, FF). When the take-up reel base is rotating, the friction torque of the detector disc is generated by the rubbing action of the detector spring and detector felt placed between the idler gear and the detector disc, and this torque exerts its force in the opposite direction of take-up reel rotation. This friction torque is used to move the detector lever to the right (or left). As long as the reel base continues to rotate, the back and forth motion of the detector lever will also continue.
4. When the tape is fully taken up and the reel base stops, the shape of the cam (on the cam gear) and the friction torque of the detector disc act to position the detector lever in the center position.
5. Next, the cam gear continues to rotate, so pin (B) of the cam gear presses pin (A) of the detector lever.
6. The detector lever, being moved by the cam gear, moves the stop lever (via the coupling link) in the direction of ⑬ and pulls the lock plate in the ⑭ direction to release the button lock. All mechanisms are returned to STOP mode.

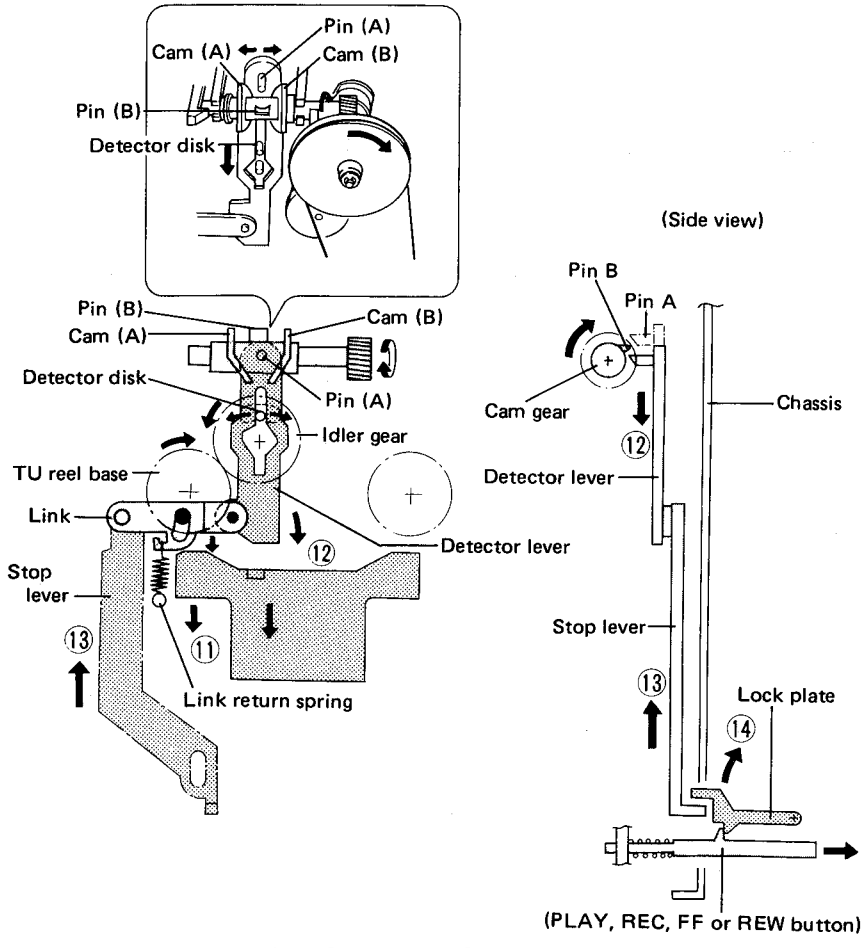
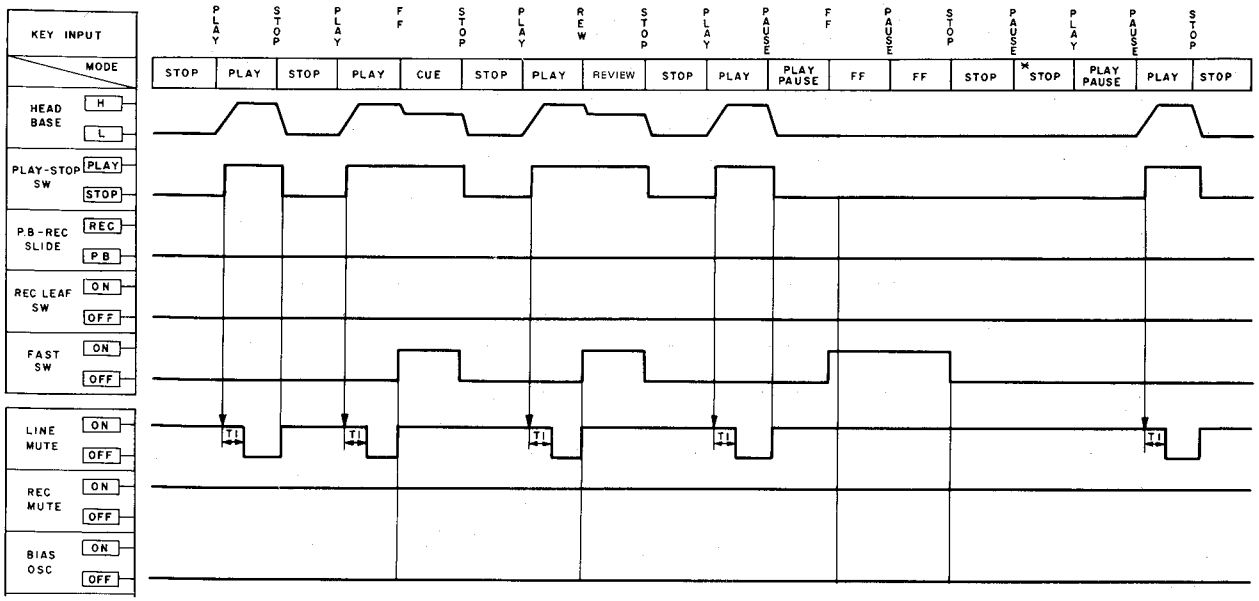


Fig. 13-12 AUTO-STOP operation

Timing Charts

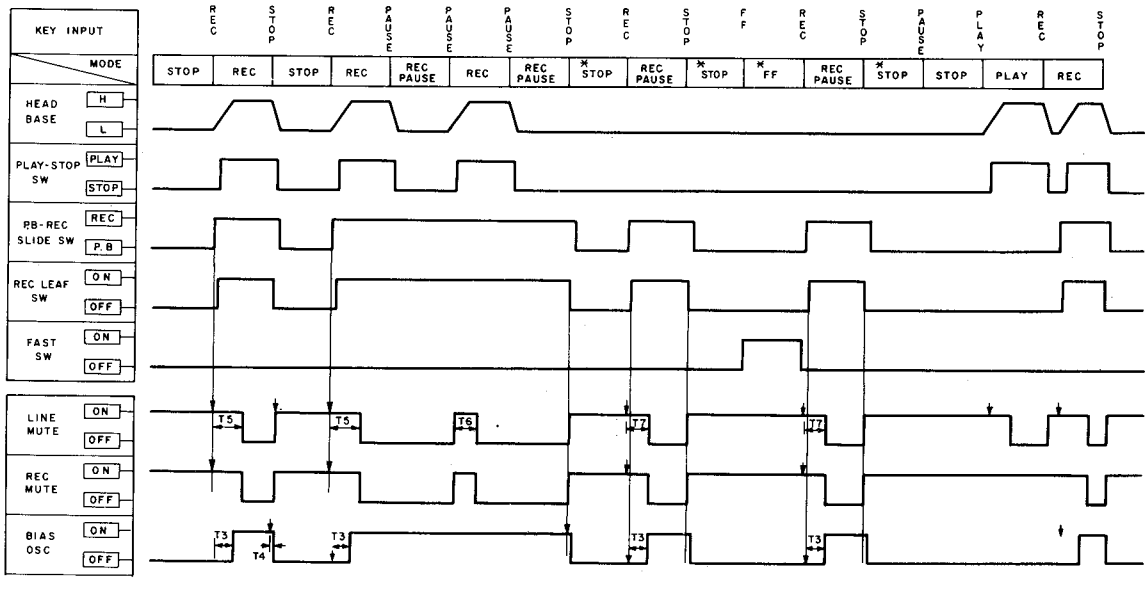
PLAY

- The MS function (CUE and REVIEW) does not apply to the DC-200Z (201Z)

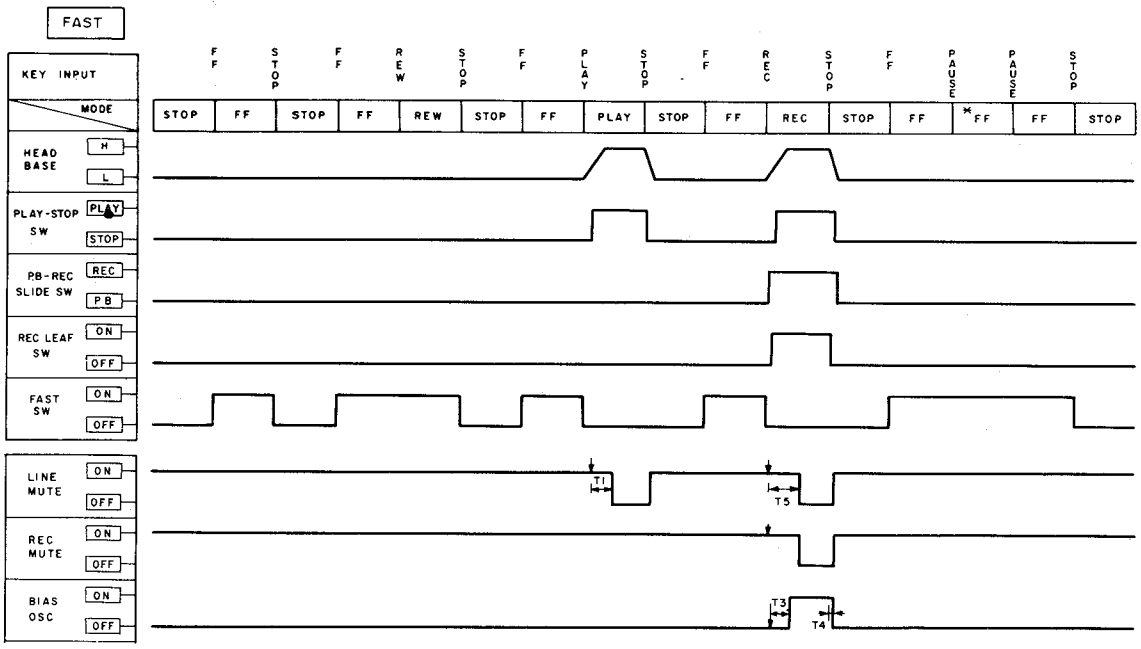

KEY INPUT
MODE
HEAD BASE H L
PLAY-STOP SW PLAY STOP
P.B-REC SLIDE REC P.B
REC LEAF SW ON OFF
FAST SW ON OFF
LINE MUTE ON OFF
REC MUTE ON OFF
BIAS OSC ON OFF
PLAY STOP PLAY STOP PLAY FF STOP PLAY REW STOP PLAY PAUSE FF PAUSE STOP PAUSE PLAY PAUSE STOP
STOP PLAY STOP PLAY CUE STOP PLAY REVIEW STOP PLAY PLAY PAUSE FF FF STOP *STOP PLAY PAUSE PLAY STOP
T1

DELAY TIME
T1 400 mS
T2 1 S

REC


KEY INPUT
MODE
HEAD BASE H L
PLAY-STOP SW PLAY STOP
PB-REC SLIDE SW REC P.B
REC LEAF SW ON OFF
FAST SW ON OFF
LINE MUTE ON OFF
REC MUTE ON OFF
BIAS OSC ON OFF
REC STOP REC PAUSE PAUSE PAUSE STOP REC STOP FF REC STOP PAUSE PLAY REC STOP
STOP REC STOP REC REC PAUSE REC REC PAUSE *STOP REC PAUSE *STOP FF REC PAUSE *STOP STOP PLAY REC
T5 T6 T7 T3 T4

DELAY TIME
T3 25 mS
T4 15 mS
T5 800 mS
T6 400 mS
T7 400 mS



DELAY TIME

T1	400mS
T3	25mS
T4	15mS
T5	800mS

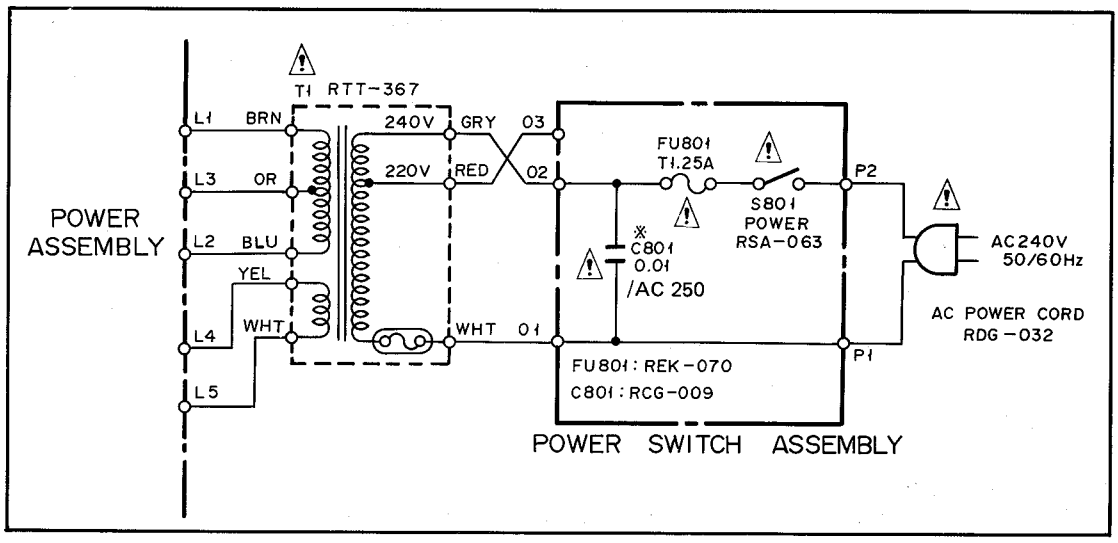
14. SUPPLEMENT FOR HB TYPE

Model DC-201Z/HB (United Kingdom model) is the same as the DC-200Z/HE with the exception of this supplement.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.		Remarks
		DC-200Z/HE	DC-201Z/HB	
⚠	AC power	RDG-027	RDG-032	
	Front panel	RNT-041	RNT-042	
★★	Door assembly	RXX-451	RXX-455	
	Operating instructions	RRE-065	.....	English/German/French/Italian
	Operating instructions	.....	RRB-235	English
	Packing case	RHG-744	RHG-749	

Power Supply Circuit for HB Type



15. SUPPLEMENT FOR KU TYPE

Model DC-201Z/KU (U.S.A. model) is the same as the DC-200/HE with the exception of this supplement.

Contrast of Miscellaneous Parts

ELECTRICAL COMPONENTS

Mark	Symbol & Description	Part No. DC-200Z/HE	Part No. DC-201Z/KU	Remarks
⚠★★	FU501, FU601 Fuse (T2.5A)	REK-054	.....	
	Fuse (3.15A)	.....	REK-083	
⚠★★	FU701 Fuse (T1.6A)	REK-069	.....	
	Fuse (1.6A)	.....	REK-074	
⚠★★	FU801 Fuse (T1.25A)	REK-070	.....	
	Fuse (3.15A)	.....	REK-083	
⚠ ★	T1 Power transformer (220/240V)	RTT-367	.....	
	Power transformer (120V)	.....	RTT-383	
⚠	AC power cord	RDG-027	RDG-048	
⚠	Strain relief	REC-396	REC-395	for AC power cord

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No. DC-200Z/HE	Part No. DC-201Z/KU	Remarks
	Power assembly	Non supply	Non supply	Fuses, R740, C710
	Power switch assembly	Non supply	Non supply	R801, C801

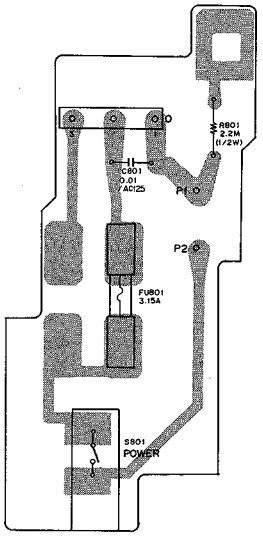
OTHERS

Mark	Symbol & Description	Part No. DC-200Z/HE	Part No. DC-201Z/KU	Remarks
	Front panel	RNT-041	RNT-042	
★★	Door assembly	RXX-451	RXX-455	
	Operating instructions	RRE-065	.....	English/German/French/Italian
	Operating instructions	.....	RRB-235	English
	Packing case	RHG-744	RHG-751	

- **Power Assembly for KU Type**

Power assembly for KU type is the same as the power assembly for HE type with the exception of following sections.

	Symbol & Description	HE type	KU type
R740	Carbon film resistor	.....	RD¼PM 1R8J
C710	Electrolytic capacitor	CEA 221M 16	CEA 221M 35

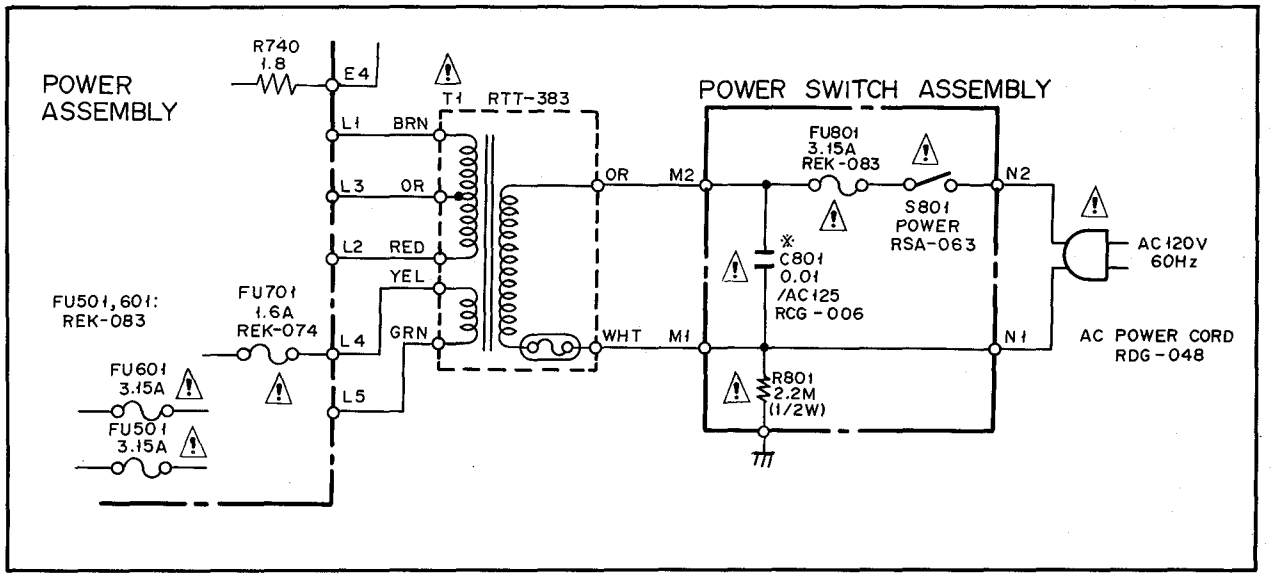


- **Power Switch Assembly for KU Type**

Power switch assembly for KU type is the same as the power switch assembly for HE type with the exception of following sections.

	Symbol & Description	HE type	KU type
⚠ C801	Ceramic capacitor	RCG-009	RCG-006 (RCG-009)
⚠ R801	Carbon film resistor	.....	RD½PMF 225J

Power Supply Circuit for KU Type



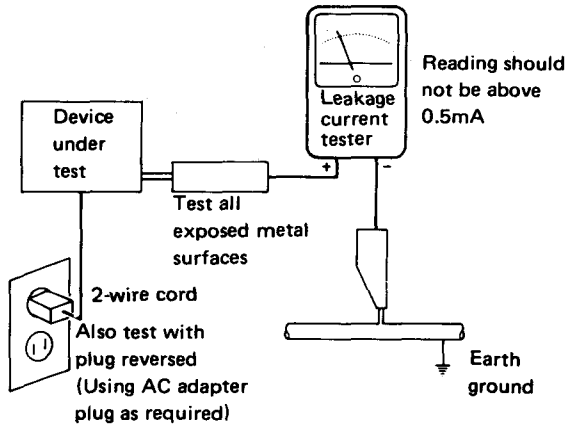
Safety Information

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not be above 0.5mA
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

16. SUPPLEMENT FOR HEZ TYPES

Models DC-200Z/HEZ and DC-201Z/HEZ (West Germany model) are same as the DC-200Z/HE with the exception of this supplement.

Contrast of Miscellaneous Parts

CAPACITORS

Mark	Symbol & Description	Part No.			Remarks
		DC-200Z/HE	DC-200Z/HEZ	DC-201Z/HEZ	
	C2, C3 Ceramic	.....	CKDYF 473Z 50	CKDYF 473Z 50	

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.			Remarks
		DC-200Z/HE	DC-200Z/HEZ	DC-201Z/HEZ	
	Power assembly	Non supply	Non supply	Non supply	
	Control assembly	Non supply	Non supply	Non supply	

OTHERS

Mark	Symbol & Description	Part No.			Remarks
		DC-200Z/HE	DC-200Z/HEZ	DC-201Z/HEZ	
	Front panel	RNT-041	RNT-041	RNT-042	
★★	Door assembly	RXX-451	RXX-451	RXX-455	
	Operating instructions (German)	.....	RRD-068	RRD-068	
	Operating instructions (English/German/French/Italian)	RRE-065	.....	.....	
	Packing case	RHG-744	RHG-744	RHG-749	

- **Power Assembly for HEZ Type**

Power assembly for HEZ type is the same as the power assembly for HE type with the exception of following sections.

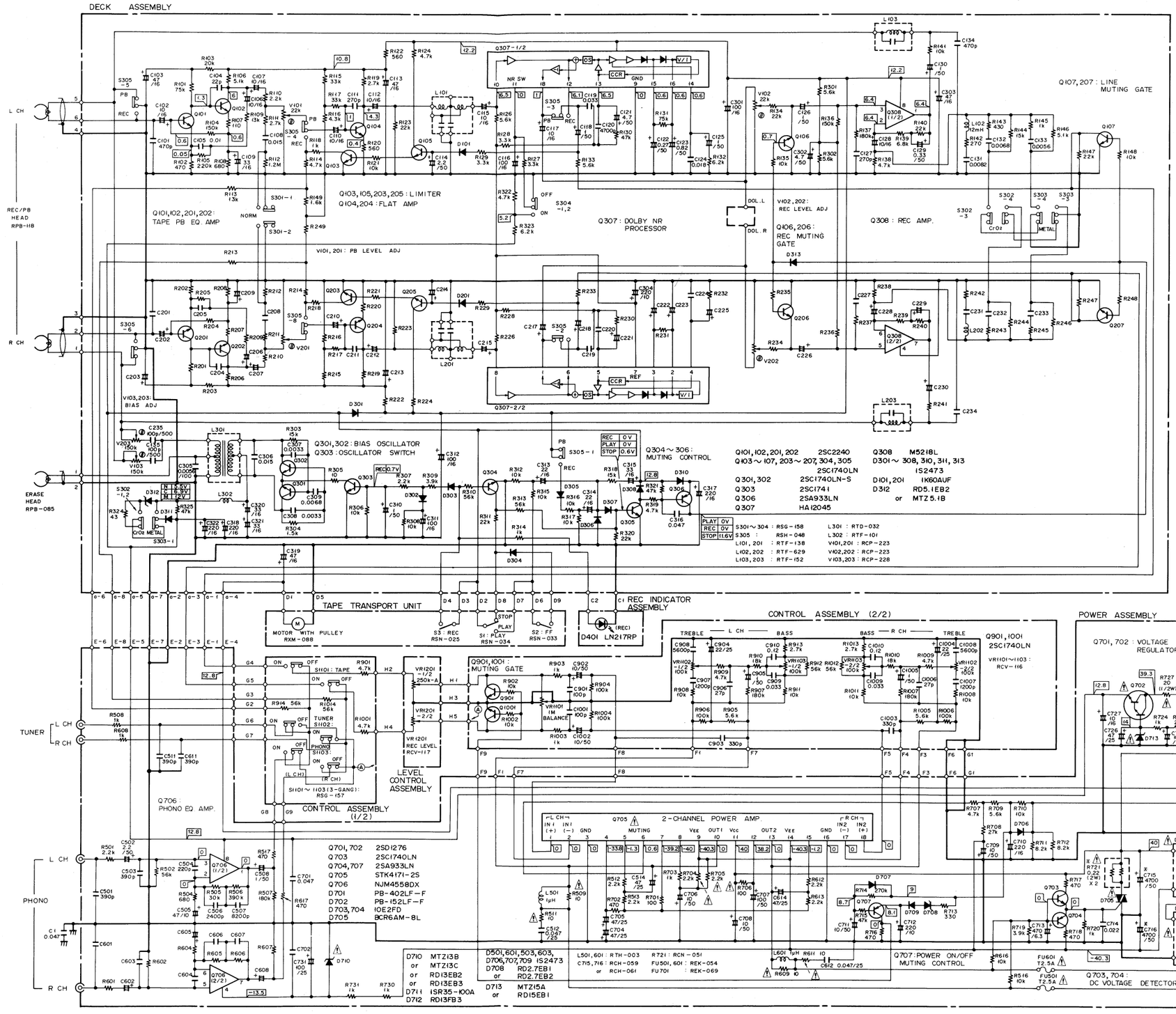
Symbol & Description	HE type	HEZ type
L502, L602 AF choke coil	.....	RTH-004
C501, C511, C601, C611	.....	CKPYB 391K 50
C503, C603	CKPYB 221K 50	CKPYB 391K 50
C504, C604	CCPSL 101J 50	CKPYB 221K 50
⚠ R510, R610	.....	RD1/4LF 100J
R508, R608	RD1/6PM 511J	RD1/6PM 102J
C701, C702	CKDYF 223Z 50	CKDYX 473M 25
R501, R601	RD1/6PM 511J	RD1/6PM 222J
R503, R603	RD1/6PM 511J	.....

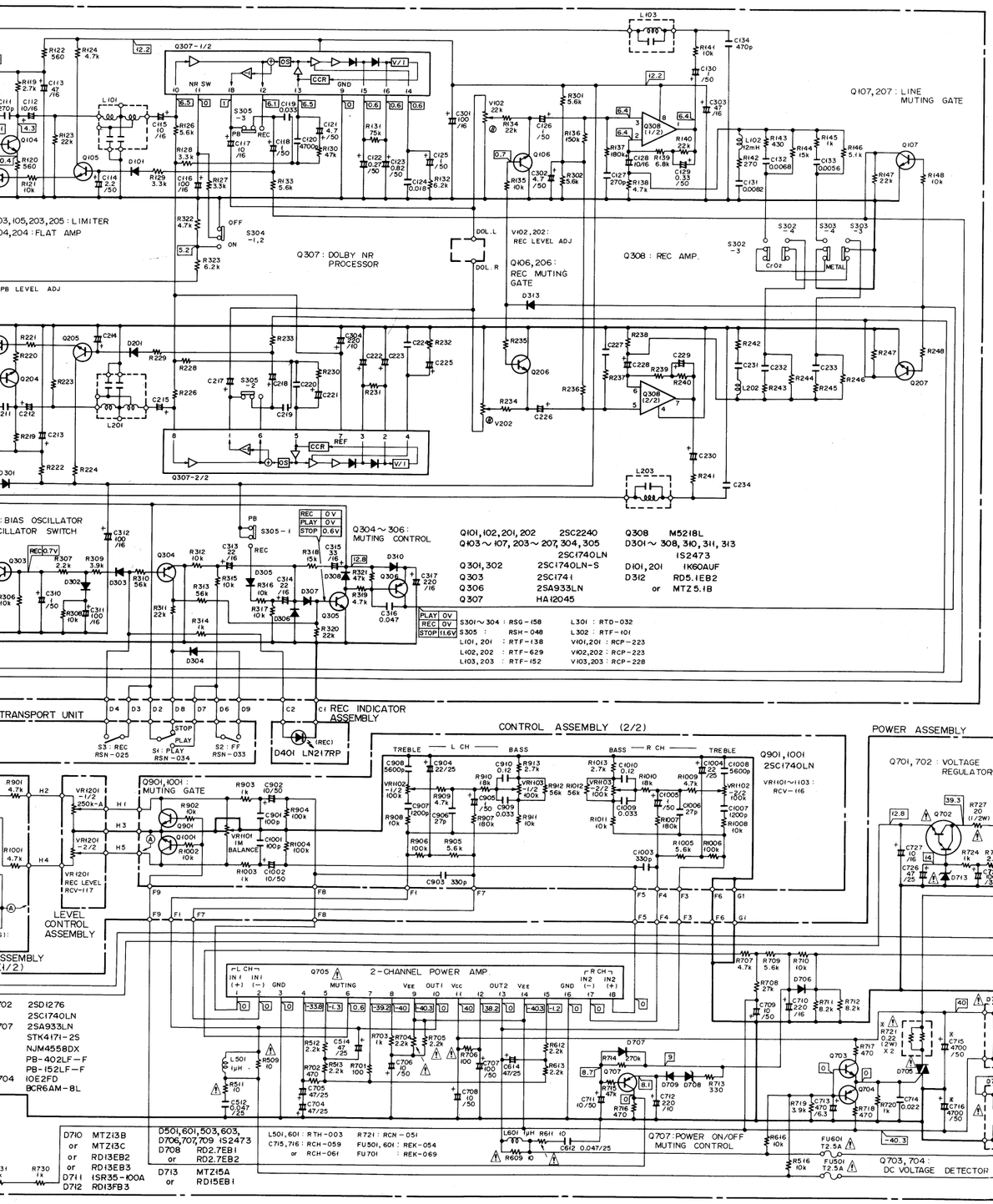
- **Control Assembly for HEZ Type**

Control assembly for HEZ type is the same as the control assembly for HE type with the exception of following sections.

Symbol & Description	HE type	HEZ type
C903, C1003	CCPSL 101J 50	CKPYB 331K 50

Schematic Diagram for HEZ Type





1. RESISTORS.
Indicated in Ω, ¼W, ⅛ W, ±5% tolerance unless otherwise noted k; k Ω, M; MΩ, (F); ±1%, (G); ±2%, (K), ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
; DC voltage (V) at no input signal

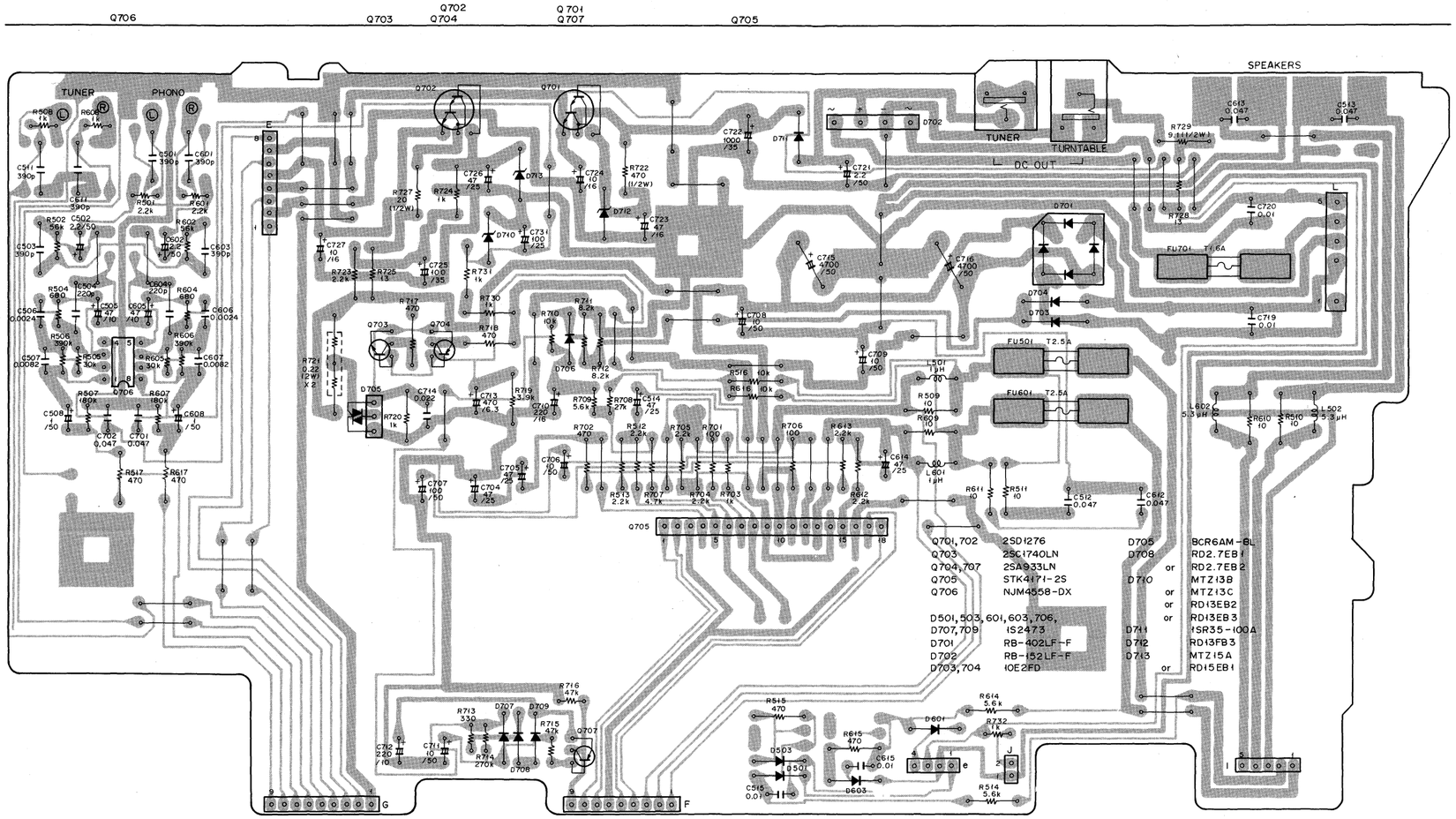
4. OTHERS:
➡ ; Signal route.
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

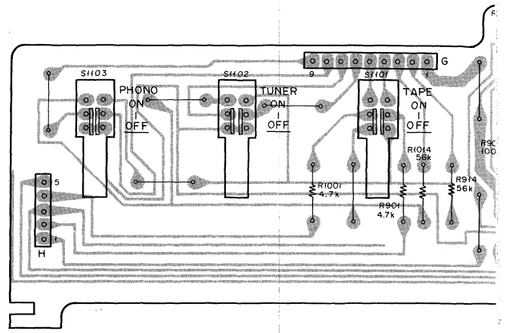
SWITCHES:
TAPE TRANSPORT UNIT
S1 : PLAY PLAY — STOP
S2 : FF FF — OFF
S3 : REC ON — OFF
DECK ASSEMBLY
S301(2/2) : TAPE SELECTOR NORM
S302(4/4) : TAPE SELECTOR CrO2
S303(4/4) : TAPE SELECTOR METAL
NORM — CrO2 — METAL
S304(2/2) : DOLBY NR ON — OFF
S305(8/8) : REC/PB SELECTOR RECORDING — PLAYBACK
(7/8 : VACANCY)
CONTROL ASSEMBLY
S101 : FUNCTION SELECTOR TAPE
S102 : FUNCTION SELECTOR TUNER
S103 : FUNCTION SELECTOR PHONO
TAPE — TUNER — PHONO
POWER SWITCH ASSEMBLY
S801 : POWER ON — OFF

The underlined indicates the switch position.

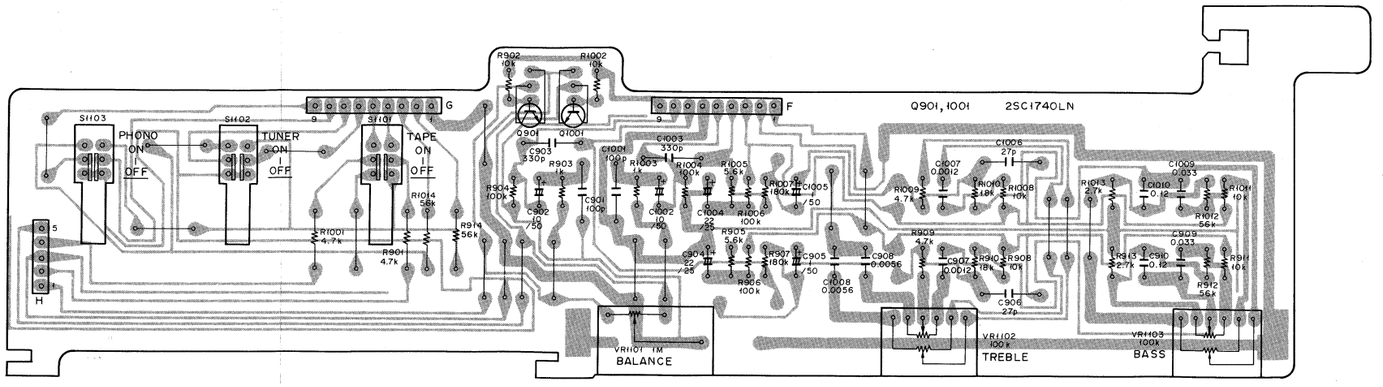
Power Assembly for HEZ Type

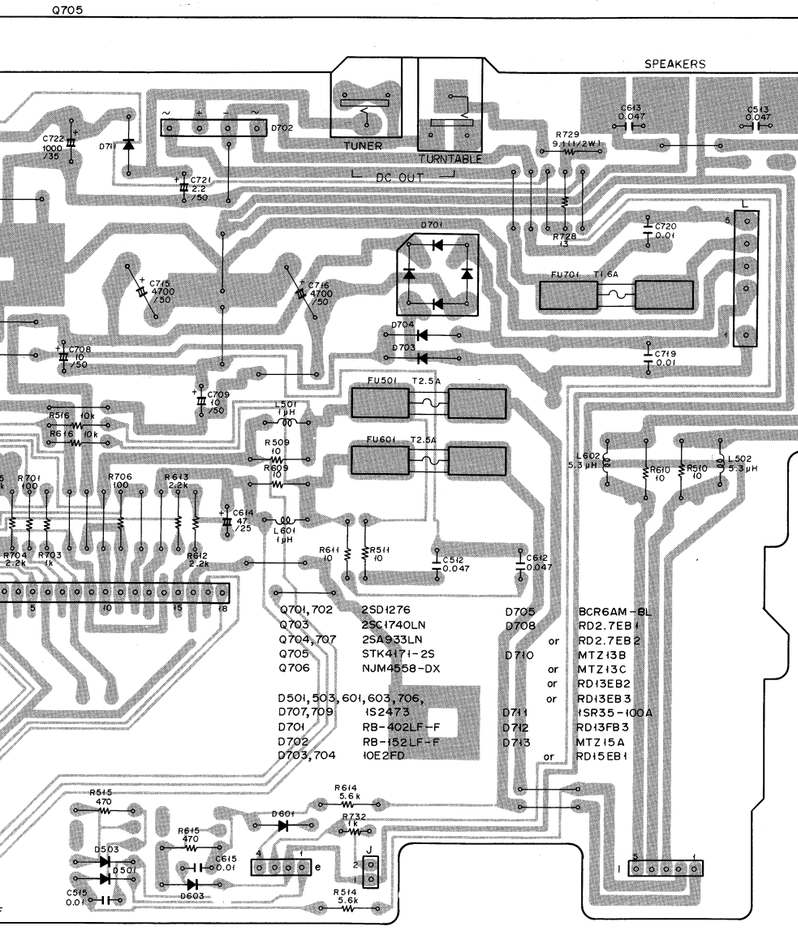


Control Assembly for HEZ Type



Control Assembly for HEZ Type





QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

QUESTIONNAIRE

Modèle _____

Un modèle par questionnaire

Cher Monsieur,

Merci pour votre coopération à propos du service après-vente des produits PIONEER.

Ce questionnaire a pour but l'amélioration de notre service d'entretien et des manuels de nos produits. Nous vous prions d'évaluer dans ce questionnaire les éléments de nos manuels de service. Vos conseils seront précieux et pris en considération dans la réalisation de nos produits dans l'avenir.
En vous remerciant d'avance, agréez, cher monsieur, l'expression de nos sentiments distingués.

PIONEER ELECTRONIC CORPORATION

T. Nakagawa, Manager, Service Section, Administration Department, International Division

1. ÉVALUATION EN FACILITÉ DE SERVICE MODÈLE	Cerclez le numéro. Bon, Passable, Mauvais,
a. Démontage/remontage	1 2 3 *4 *5
b. Examen de circuits	1 2 3 *4 *5
c. Rechange de pièces	1 2 3 *4 *5
d. Facilité de réglage	1 2 3 *4 *5

* Si vous cerclez No. 4 ou 5, donnez l'explication concrète.

e. Votre conseil ou avis sur le service

2. VOTRE APPRÉCIATION DU MANUEL DE SERVICE

a. Circuit et description du mécanisme.

b. Diagramme du circuit.

3. AUTRES

Anotez les autres points difficiles à réparer.

Répondu par : **Date :**

Nom : Âge :

Compagnie :

Adresse :

Adressez-vous ce questionnaire au distributeur, S.V.P.

ENCUESTA

Modelo_____

Uno modelo por encuesta

Querido señor,

Muchas gracias por su cooperación en el servicio de post-venta de los productos de Pioneer. Esto es para mejorar el servicio de post-venta de nuestros productos. Les pedimos a ustedes responder a las preguntas siguientes. Su opinión e idea estarán tenido en cuenta en los productos futuros.

Nos complacemos en saludarles muy atentamente,

PIONEER ELECTRONIC CORPORATION

T. Nakagawa, Manager, Service Section, Administration Department, International Division

1. EVALUACION EN LA FACILIDAD DE SERVICIO

MODELO

Marque uno entre los numeros siguientes.

	Bueno		Medio		Malo
a. Desmonte:	1	2	3	*4	*5
b. Examen de circuito:	1	2	3	*4	*5
c. Reemplazo de piezas:	1	2	3	*4	*5
d. Ajuste:	1	2	3	*4	*5

* Si marca (4) o (5), ejemplifiquelo concretamente.

e. Su consejo, opinión u idea en el servicio de este modelo.

2. EVALUACION DEL MANUAL DE SERVICIO

a. Circuito & Descripción de mecanismos.

b. Diagrama del circuito.

3. OTRAS

Describe otras partes dificiles de reparar.

Respondido por : Fecha :

Nombre : Edad :

Compañía :

Dirección :

Manda esta enquesta al domicilio del distribuidor, por favor.